JANUARY 29, 1951

STEEL

The Weekly Magazine of Metalworking

Less Inspection, Fewer Rejects

through

STATISTICAL QUALITY CONTROL

—page 58

Do's and Don'ts of Questionnaires, p. 34

Equipment To Meet Defense Plating Needs, p. 63

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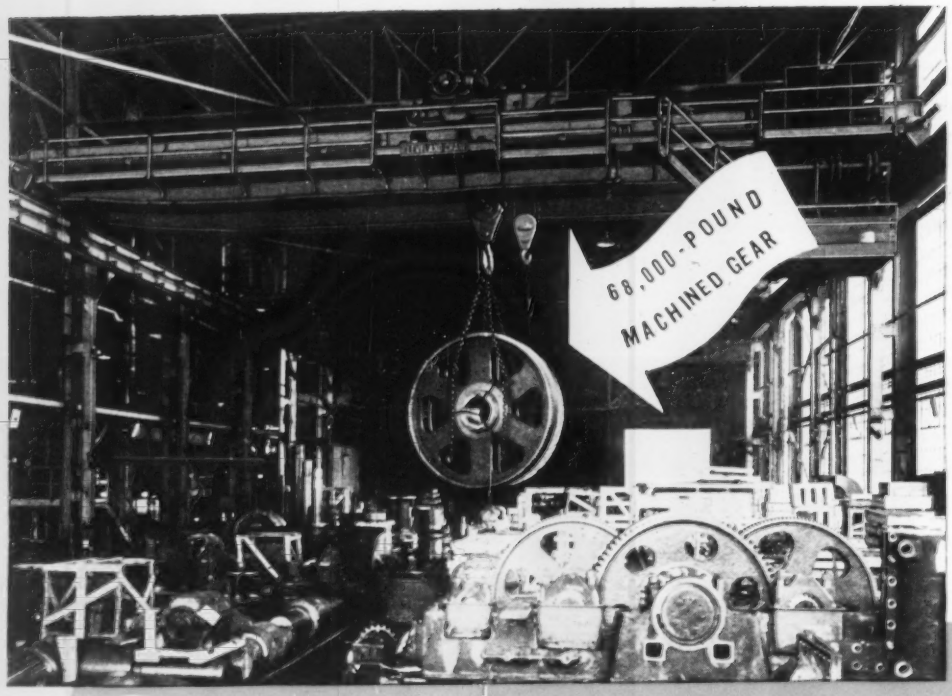

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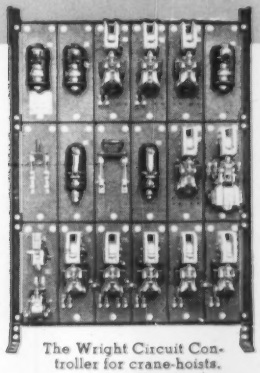
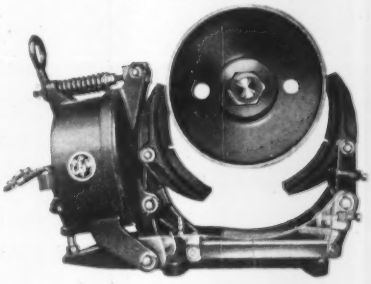
The EC&M Wright Circuit Controller and the EC&M Type WB Brake are an unequalled combination for D.C. crane-hoists. The Wright Circuit puts all the current from the line on the first point lowering through the coil of the quick responding WB Brake. The result is *fast brake release*—accurate spotting of loads with a minimum number of movements of motor, contactors and brake. Maintenance men recognize this as a contributing factor to reduced up-keep.

The operator has complete control of the load at all times in lowering. The Wright Circuit is SAFE! Specify EC&M Control when buying new cranes or revamping existing ones.



The Wright Circuit Controller for crane-hoists.



Type WB Brake for hoist motors.

Photograph—Courtesy, Cleveland Crane and Engineering Co.

THE ELECTRIC CONTROLLER & MFG. CO.

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STEEL
The Weekly Magazine of Metalworking
VOL. 128 NO. 5 JANUARY 29, 1951

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Next Week **... LP Gas—Btu Unlimited ... Steam Coil Fabrication Combines Latest Forming, Welding Methods ... How To Set Up a Successful Equipment Replacement Program ... Abrasive Tumbling—A Precision Finishing Method**

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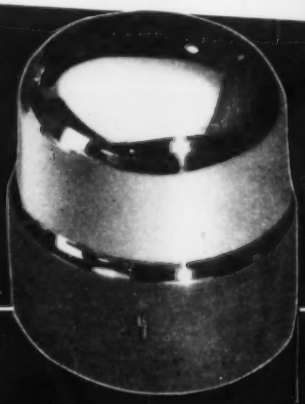

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Behind the Scenes . . .

Sticky Question

Our tongue is thick, our taste buds battered because of some experiments necessitated by this epistle from W. P. McKain, general superintendent of Acme Fishing Tool Co., Parkersburg, W. Va.:

Dear Shrdlu:

My secretary and I defy you to make these two pieces of paper (a routing slip we supply subscribers and a cover from a STEEL issue) stick together more or less permanently without the addition of other adhesive. Is it the slick paper or the non-sticky glue? The glue has a horrible taste. This letter is not intended for your Puzzle Corner.

Divers research reveals that Mr. McKain's problem first arose when we started to add the varnish coat to the covers of STEEL. At that time our mailing department complained that the routing slips being used here would not stick. The matter was referred to our suppliers of gummed stock. They accordingly supplied us with a stock containing an amount of fish oil, which accounts for that taste.

Our experiments and consultation with a representative from the paper company disclose that the gummed stock must be thoroughly wet. Let it partially dry, then wet it again and it will stick to anything, even steel.

Another solution would be to omit the varnished coating on the cover, but that is used to make the cover more attractive and more durable.

Taboo

The word "conversion," we are informed, is taboo in National Production Authority's Office of Small Business in connection with replacing non-essential civilian work with military or essential civilian work. NPA offers this reason for its suppression of a fine word derived from Old French: No real conversion should be required if work is properly selected to fit the facilities of a plant.

They Like Them

Requests for reprints are rolling in on two editorial jobs—Vance Bell's buyers' guide in the Jan. 15 issue and Art Allen's roundup on titanium, Jan. 8.

Among the many letters coming in on the guide is one from D. L. Irvine, assistant general manager of sales for Wheeling Steel Corp. He says: "I am sure that steel buyers will come to consider the guide indispensable."

Tom Lippert, general manager of Titanium Metals Corp. of America, writes: "You have done an excellent job on the titanium article." He tempers his remarks with comments on the little symbolic airplane used on the cover of the Jan. 8 issue to help show possible uses for the metal.

The plane seems to have no visible means of propulsion, he says. We're not letting everybody in on this, but that plane is propelled by a new mystery fuel — plutonium enriched with neptunium.

Reprints of the guide are available from STEEL's Readers' Service Department, 1213 W. 3rd St., Cleveland 13, at these prices: One to nine copies, 50 cents each; ten to 24, 40 cents; 25 to 49, 35 cents, 50 or more, 30 cents. A limited number of the titanium reprints are available gratis.

Not Guilty

A company bought the space in the column on our left for an ad some weeks hence. In specifying the position it wanted, it wrote "Next to 'Behind the Curtain'."

Puzzle Corner

George E. Dunn of Universal Products Co. Inc., reports that our politician-statesmen problem of Jan. 8 is a variation on a classical puzzle that dates back to the Middle Ages when the subjects were Christians and Turks.

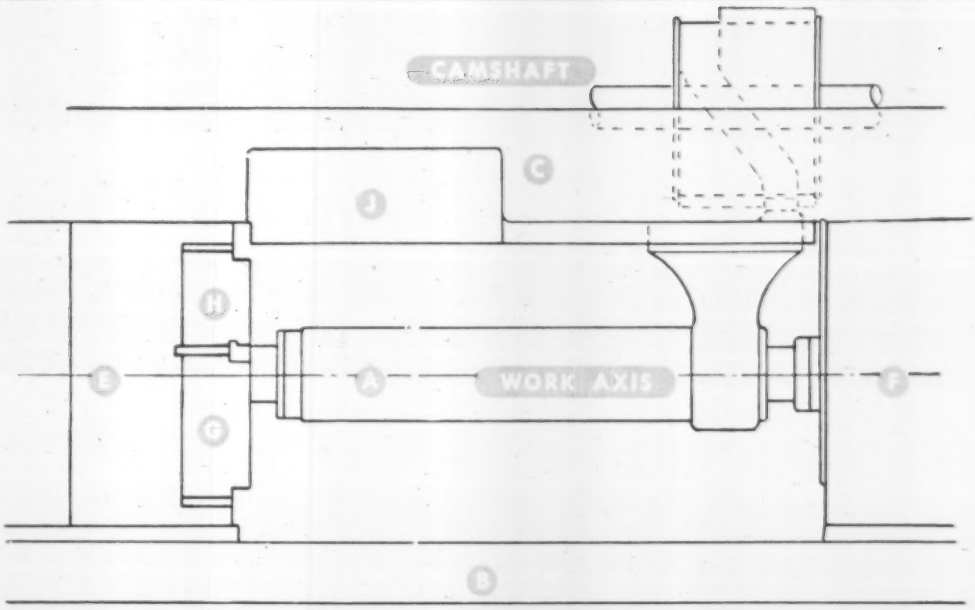
He tells us of another classic: A man drops a 40-pound block of iron. It breaks into four unequal pieces. The man discovers that with a scale balance he can weigh any weight up to 40 pounds in pound increments by means of the four pieces. What are the weights of the pieces?

Here's the answer to the football problem of Jan. 15: Albie's blue Tufts team defeated Ben's purple Temple team 6 to 3 in the final game. Ben's purple Temple team defeated Bill's brown Tulane team in the second game, and Albie's blue Tufts team defeated Barry's red Trinity team in the first contest.

Good football fans were C. E. Blass of Talon Inc., C. E. Norton of Highland Park., Ill., Jack Campbell of Ohio Steel Foundry Co., T. S. Bean of Barber & Ross Co., M. S. Bailey of Machine Products Corp. and Robert W. Huff of Canton, O.

Shrdlu

(Metalworking Outlook—page 21)



THE *good* THAT MEN DO

The horizontal design Tooling Area, shown above, is a contribution by Frank L. Cone to the improvement of the Multiple Spindle Automatic Bar Machine that will live long after him. The advantages, stated below, are made possible by the machine's Overhead Camshaft. Specific data invites comparison.

THE TOOLING AREA OF THE CONOMATIC (1½" Six Spindle):

1. **Handles longer work than can be handled by the tooling area of any other "automatic."**

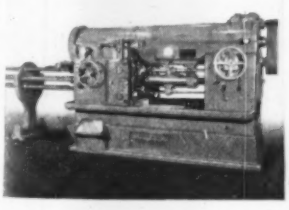
   The length of the Tooling Area is 46 7/16 ins., which permits standard machining operations on work up to 18 ins. in length from the face of the cut-off tool.

2. **Is more strongly supported by the machine frame than is the tooling area of any other "automatic."**

   The stocky Uprights, E and F, which are shorter than those of other "automatics," are securely bolted to — and held between — the Top Bed, C, and Base, B, which are larger and heavier than such members of other "automatics." *The Uprights are 22" high. The Top Bed is 8" high, 23" wide and 103¼" long. It weighs 1232 lbs. The Base is 33⅞" high, 46" wide and 110" long. It weighs 6655 lbs.*

3. **Provides more Tooling positions than does any other "automatic."**

   The Main End Slide, A, has 6 positions. The Main Cross Slides, G and H, front and rear, have 6, and the Auxiliary Cross Slide, J, front and rear, are 2 more, which make a total of 14.



Buyer's Comparison Chart will guide you to full information

A Comparison of ALL Automatics is in Favor of Cone

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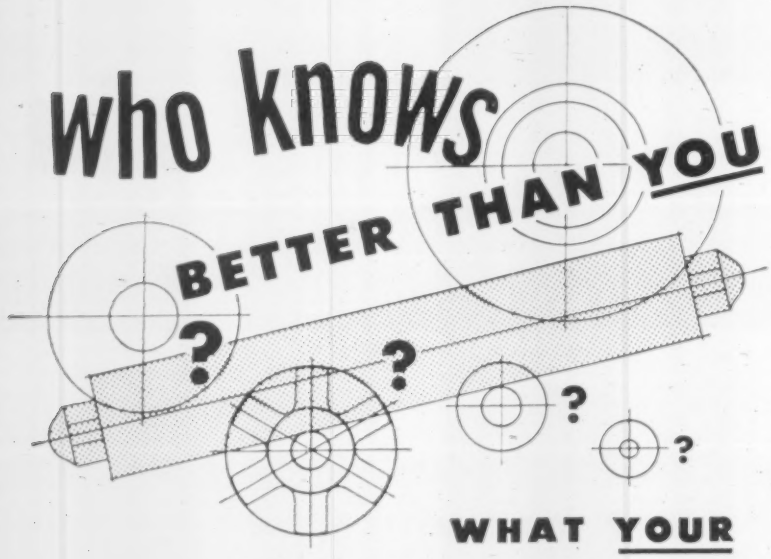

WHAT YOUR ROLL REQUIREMENTS ARE?

When your roll requirements can be satisfied by rolls built to liberal tolerances you don't want the expense of dimensions held to a "tenth" . . . and when you must have rolls with critical tolerances around that "tenth" you can't afford *not* to get that precision . . . *the first time!*

That's where Gorham rolls fit into your picture. We're completely equipped and qualified to fill your requirements in cold mill rolls, including working rolls, intermediate rolls, drive rolls and specials. *Your* specifications run the show. When you want ordinary commercial tolerances, that's what you get . . . and when you require extremely close tolerances, our experience, equipment and skilled personnel assure you precision, right on the "tenth".

Gorham rolls are manufactured from the steel best suited to your job, properly heat treated for correct hardness and wear resistance and ground to the dimensions and finish *you* specify. We furnish a wide variety—from small rolls for the smallest Sendzimir precision strip mill up to rolls 14 inch diameter, 6 feet long. Gorham field service engineers, who can give you valuable assistance, are conveniently located in principal industrial centers.

We invite you to join the list of operators *and* manufacturers of rolling mills whom we now serve. You'll find us a convenient and cooperative source for your roll requirements. Send us details of your rolling problems for recommendations, or your roll specifications for a prompt quotation.

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LETTERS
TO THE EDITORS

Does It Without Ice

In the Dec. 25th issue of STEEL you wrote up a preservative for soluble type cutting oils and coolants which has no odor and has no germs. It was used by Yale & Towne Mfg. Co., Philadelphia Division. Would it be possible for you to advise us the name and address of the company making the preservative?

S. R. Snyder, Assistant to the President
Soss Mfg. Co., Detroit, Mich.

• *Preservative is made by West Disinfecting Co., 42-16 West St., Long Island City 1, N Y.*

Slag Is Hot

I wonder if it would be possible for you to obtain information for us regarding the following: What is the tem-

perature of slag at the time it is released from the blast furnace; that is, a furnace producing pig iron?

Edgar M. Heitman
Sperti Inc., Cincinnati, O.

• *Temperature of slag leaving the cinder notch of a blast furnace, or tapped with the iron at casting time, varies with the type of slag. For a furnace burdened on basic iron the temperature of the slag will range from 2680 to 2895° F.*

Continuous by Rossi

In a recent issue there appeared an article on continuous casting of steel. In it was the name of Mr. Irving Rossi of Rossi Engineering Co. Would you be kind enough to give us the address of this company?

Arthur C. Page
Cumberland Steel Co., Cumberland, Md.

• *The article, "Interest in Continuous Steel Casting Gains Momentum", appeared in the Dec. 25 issue, page 68. Mr. Rossi is also affiliated with Rossi Continuous Casting Co., Room 6003, 40 Wall St., New York, N. Y.*

Slight Error Dept.

On page 67 of the Dec. 18th issue there appears a tabulation entitled, "Steel Industry at Start of Three Wars". In the statistics shown the number of blast furnaces is given as 973. Unless I am badly mistaken, this figure should be around 450, including charcoal furnaces.

H. W. Jolly
Republic Steel Corp., Cleveland, O.

• *Correct. The number of blast furnaces at the start of World War I was 448. The figure of 973 is correct for the number of steelmaking furnaces at the start of World War I.*

The Metalworking Outlook

Transition to Controls: Fairly Smooth

Immediate effects of price controls will be surprisingly mild: Some discomfort, of course, among the few who failed to adjust quotations before the roll-back date, yet all-in-all the transition to curbs will be reasonably smooth. But don't be fooled by the short price control honeymoon. The troubles will start—probably on a big scale in 9 to 12 months—when the weakness of the wage regulations becomes apparent. For politics are dictating wage limitations that will not parallel those on prices. Hint of things to come: The coal industry has made a deal with ESA for a Feb. 1 coal price rise necessitated by the bituminous pay pact. That means higher coke costs, pig iron costs, steel costs and on and on. Where will the chain stop?

Status Quo in Steel Prices

Steel prices will probably stay put because all but a few minor producers acted on their prices weeks ago. For all practical purposes most of the industry has already stabilized on a voluntary basis as of Jan. 15. ESA sent out a request that none of the more than 200 companies in the industry raise their prices above Jan. 15, 1951, levels without first giving the U. S. 20 days' advance notice. General compliance with the request is certain.

Aircraft Flood Approaches

A good bet: A flood of aircraft contracts will appear in early February. That means thousands of subcontracts (p. 31) because the aircraft industry is not as well integrated as other metalworking groups. Aircraft producers and suppliers already in the program are urging that one tangle get unsnarled, quick. The lag between the time a letter of intent reaches a manufacturer and the time the U. S. finally manages to work up a defining contract is running to months in some instances. Cases have arisen where the producer got his letter, completed and delivered on the strength of the letter, then had to wait months for the defining contract—and his money.

More Pressure for CMP

Watch for more pressure from industry itself for a Controlled Materials Plan. Washington administrators blow hot and cold on CMP, now are about lukewarm. Metalworking purchasing agents, especially, are unhappy with the DO setup. It works, but not well, they say. They claim that sometimes they can get mill steel faster without a DO than with.

Warehouse Mixup

That paradox is responsible for a rough situation among steel warehousemen. Some customers, fed up with the DO fuss, are not extending priority orders to their warehouse purchases even when they have them to extend. Through ignorance or carelessness they don't realize that warehouses in turn need the DO's to

Production-Engineering News—p. 57 The Market Outlook—p. 99

replenish stocks. The situation is partly responsible for the fact that a small minority of warehouses refuse to do business with anyone without a DO.

West Coast Shipyards Worried

Shipyards are flexing their muscles. Most concerned about their condition are West Coast yards who have higher costs than elsewhere. They fear they'll lose out on the cargo ship construction program, but hope they'll get in later as the need rises.

Paper: Latest Bottleneck

Paper shortages are causing metalworking bottlenecks. A serious scarcity of corrugated shipping containers is fouling industrial shipments. The box shortage is expected to be even worse by September. To make supplies last longer, many corrugated paper makers are lightening the stock. About 600 box plants are scattered across the U. S. Nearly 10 per cent of their output is going to defense.

Office Space in Washington

Industrialists on loan to the government are complaining louder and louder. Many of them sit in orange-crate offices without even a telephone and try to help run the defense program while the government regulars—many in far less important jobs—hang on to 18-foot desks, carpeting and upholstered furniture.

Signs of the Times

Armco's new Middletown, O., blast furnace will be built by Arthur G. McKee & Co. and its new battery of 76 coke ovens by Wilputte Coke Oven Division of Allied Chemical & Dye Corp. . . . The railroads want an immediate interim freight rate increase of 6 per cent . . . AEC will build an atom plant near Amarillo, Tex. . . Russia withheld shipments of manganese and chrome ore to the U. S. in November.

What Industry Is Doing

Latest estimates on steel ingot capacity by the end of 1952 are 117.5 million tons (p. 29) . . . Bethlehem will add 1.6 million tons to its capacity by that time (p. 29) . . . Business groups are trying to persuade the government to reform its questionnaire procedures which nearly swamped industry during World War II (p. 34) . . . More control orders on metals are issued (p. 35) . . . The U. S. can look to its allies for some production help ahead, particularly to relieve materials shortages in American industry (p. 39) . . . A new process for recovering cobalt from domestic ores will add 4.5 million pounds of the material to stockpiles by the end of 1952 (p. 40) . . . A new auto pricing formula may permit limited increases (p. 43) . . . The momentum from the defense program, beginning to show up in production indexes, helps push industrial activity to 217, within a few points of the postwar peak (p. 47).

The Next Step!

Last Thursday our government was on the brink of a new experiment in regimentation which may affect many phases of our living for an indefinite period. Responsible Washington authorities were saying that the formal announcement of the imposition of price controls and wage and salary stabilization was only "hours" away. If these statements were correct, then such controls will have been made operative by the time this publication reaches your desk.

According to spokesmen for the Economic Stabilization Agency, the contemplated price action consists of a flat dollar and cents freeze on the prices of all commodities and services except a few, such as professional fees, which are exempted by law. Details of the plan for stabilizing wages and salaries were not available as of last Thursday.

On the face of what is known now, it is apparent that the government is going in for regulation on a much more elaborate scale than that attempted in World War II. Also, there is another important difference. Then we were in a well defined war and we knew controls would be lifted when the war was over. Today we are in a war in Korea, but even if it were ended tomorrow, the regimentation would continue indefinitely until Washington is satisfied that the danger of Russian aggression has passed.

This prospect of almost all-out regimentation with no definite terminal point is a new experience for America. Under the very best administration possible the controls will involve confusion, delays and injustice, and—as admitted by many in high places in Washington—will fall far short of stopping inflation.

Now that we have launched these drastic measures, which can be only mildly successful, does not ordinary common sense dictate that we should proceed promptly to attack inflation by a more direct route—namely, by paring nonessential government expenditures to the bone? Surely the next logical step is rigid regimentation of unnecessary federal government activity.

E. L. Shaner

EDITOR-IN-CHIEF

SQC SAVES $100,000: Almost everybody who reads American technical journals has become aware of industry's new tool called statistical quality control. Many, however, are inclined to shy away from it because they think it is exceedingly complex and because they doubt whether it has application in their operations. It can be complicated and it must be used with discrimination, but in places where it fits it can effect substantial savings. For this reason, many industrial executives should take a new look at it.

SQC involves scientific sampling somewhat along the line of Gallup poll technique, advanced

mathematics, extensive instruction of personnel, carefully planned industrial relations and enough promotion to "sell" the system to all concerned. It is particularly applicable to inspection where large volumes of identical pieces are involved. It definitely will play an important role in some war contracts.

In 2½ years SQC enabled Alemite Division of Stewart-Warner Corp. to save $100,000 by replacing piecemeal 100 per cent inspection of millions of hydraulic fittings by scientific sampling inspection. —p. 58

WHEN IN DOUBT, DON'T: Do you remember the great flood of needlessly long, involved and sometimes worthless questionnaires that descended upon industrial companies from government agencies during World War II? If so, here is good news! The Advisory Council on Federal Reports has recommended 12 practices by which federal agencies can simplify and improve their questionnaire and reporting procedures.

Most of the 12 recommendations are in the form of practices which the agencies should avoid. For instance, No. 1 is that the government should "avoid asking for data not readily available to the respondent." Another important recommendation is No. 11: "Avoid making requests for information when government facilities for processing such requests are not available." Millions of man-hours in industry were utterly wasted in World War II because these and similar rules of ordinary common sense were violated.

Another excellent recommendation would be: When in doubt, don't questionnaire. —p. 34

* * *

ATTRACTIVE, USEFUL: In recent years there has been a definite trend toward more elaborate annual reports to stockholders. Many metalworking companies have gone to great pains to "doll up" their printed annual statements with more detailed information, charts, illustrations and color.

Allegheny Ludlum Steel Corp. recently asked its stockholders what kind of a report they prefer. To date, of the stockholders who have replied, 54.7 per cent prefer a plain, one-color, factual report; 13.3 per cent want the statistics and auditor's letter only; and 29.6 per cent want a colorful, well-illustrated report.

These replies would seem to revive the old issue of ornamental versus utilitarian values. When a newspaper reporter asked President C. E. Wilson of General Motors how he rated appearance and utility in the design of automobiles, he said GM tries to give the public the equivalent of "a blond that can cook." The same idea might be applied advantageously to the preparation of printed annual reports.

—p. 35

* * *

STANDS UP AT 4600°: Today almost every advance in commercial and military transportation calls for materials that will perform satisfactorily at high temperatures. In many fields, engineers and designers are seeking alloys, ceramics or other materials that will stand up under higher temperature ceilings. Equally important is the problem of supplying the material that can handle these alloys, ceramics or what not in furnaces, ladles, etc. This is a challenge to refractories.

The Norton Co. meets this challenge with a new fused stabilized zirconia refractory which under test has withstood successfully industrial temperatures up to 4600°F. It is a poor conductor of electricity at low temperatures but an excellent conductor at high heat. It is a good thermal insulating material. Perhaps it is one of many new high-temperature resistant substances we will need to cope with the problems of tomorrow. —p. 68

* * *

CLEAN COAL IS POTENT: Years ago Ralph H. Sweetser, a veteran blast furnace operator, became a staunch advocate of clean coal. To him, clean coal—meaning coal low in ash content—was so important to efficient pig iron production that he wrote a book about it. It was the pleasant privilege of this writer to edit the text and prepare it for publication.

Everything that Ralph Sweetser said about clean coal is corroborated 100 per cent by the new coal preparation plant of Inland Steel Co. at Price, Ky. Pig iron men figure that a 1 per cent reduction in ash content of coal means a reduction of 30 cents in the cost of pig iron. Inland's new cleaning facility will reduce the ash content of its metallurgical coal from 7 to 3.5 per cent. Its cost of producing pig iron may be cut a dollar or more per ton. Think of what a boon it would be if clean metallurgical coal were the rule and not the exception! —p. 74

INTEGRATED FACILITIES FOR FAST, EFFICIENT PRODUCTION OF LARGE, HEAVY STAMPED FABRICATIONS

. . . another Reason Why

Firestone Can Help You Meet Delivery Schedules on Defense Contracts

Looking for help on your defense contracts? Then give a thought to Firestone's enlarged, modernized Metal Stampings Division. It's geared for the tough jobs; for speedy, on-time delivery of those difficult sub-assemblies and stampings now so vitally needed for defense products. No matter how many operations are required, your job never leaves the plant at Firestone Steel Products until it's loaded in the car. Precious time is saved, tight production schedules roll through as planned. Remember, Firestone is your sole supplier; — there's only one responsibility. You get your material the way you want it, *when* you want it. For complete information on the job Firestone can do for you, send drawings or blueprints to Firestone Steel Products Company, Metal Stampings Division, Akron 1, Ohio.

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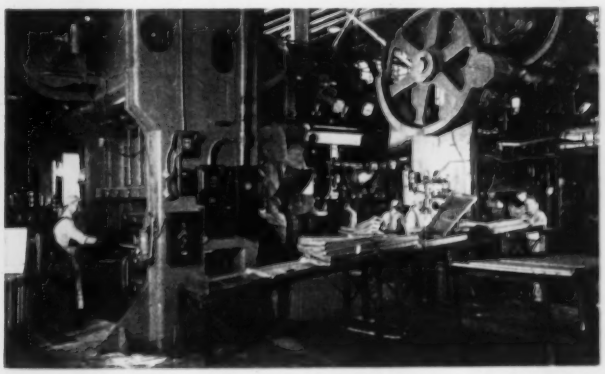

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RYERSON STEELGRAMS

Swift-changing conditions in today's steel market are so difficult to follow—perhaps these few paragraphs will prove helpful.

Warehouse steel stocks were again recognized as vital to defense by the Government's NPA order which allots a share of "free tonnage" production to steel distributors. The regulation is helpful. However, even at this early stage, Rated Orders and special government programs have substantially reduced total "free tonnage" — reducing the share going to distributors proportionately.

We are doing everything possible to maintain reasonable stocks for warehouse buyers. But, as we see it at the moment, we shall have less steel to distribute among our many customers in the coming months. It will be helpful if you order only for immediate needs and extend DO ratings whenever possible.

More steel will be available in some specialized cases. Example: Ryerson stocks of aircraft alloys. New program gives Ryerson plants a range of more than 400 sizes, finishes and conditions of aircraft alloy bars and strip. Included are alloys for aircraft parts manufacturers, airframe makers and engine builders conforming to new MIL-S and to AMS specifications. Aircraft quality stainless stocks have also been enlarged.

More on stainless and alloys — Some steel users may not know that the Government is issuing a single set of MIL (Military) specifications to replace the different U. S. Army, Navy, Air Force, Air Force-Navy, and Federal specifications previously in effect. The new specifications for a few products have yet to be published, but Ryerson alloy and stainless stocks assure a warehouse source for all the important MIL "specs" now in effect and, as additional products are covered, Ryerson stocks will be immediately brought into line.

Ryerson tubing stocks, not affected quite as much as some products by the tight steel market, are being enlarged to include Rockrite tubing (with close I. D. tolerance and better I. D. finish for hydraulic cylinder applications) and pressure tubing to JIC "specs". Fairly adequate stocks of both are in prospect. This is in addition to seamless and welded mechanical tubing, extra heavy wall hot rolled tubing, structural tubing.

Changes on the nation's railroads are not confined to rolling stock, in railway shops alloy chain is finding increased acceptance as a replacement for wrought iron slings. Reasons are easy to find. The alloy chain packs three times the tensile strength of wrought iron. Lasts 5 to 15 times longer. Taylor Made Alloy chain, available from Ryerson, costs little or no more than wrought iron. It is widely used for overhead lifting in most all industries. Other types of chain also available for prompt shipment.

Wire rope, especially desirable where chain may cause damage, is currently available in a wide range of types and sizes. Shipment from Ryerson is prompt.

Availability of high tin content babbitt metal is threatened by the short tin supply. Not affected -- Ryerson production of Glyco babbitt metal. Made by a special process, it has physical properties equal to those of high-tin babbitt, costs considerably less, and remains in good supply.

Indications are that metal fabricators contemplating purchase of machinery and tools should make an early decision on placing orders. Ryerson can still make fairly prompt shipment on many types, but demand is strong and delivery schedules are lengthening. All but lighter tools are currently offered on the basis of 5 to 8 months.

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More Steel Coming Up!

Additional expansions assure nation of steel ingot capacity of 117.5-million-ton mark by end of 1952. And even this may be exceeded

MORE STEEL coming up!

In effect those were the terse words from the steel industry last week.

They may sound repetitious now because of the flood of expansion plan announcements in the last few weeks and months, but they're still good news. They mean even more steel is on its way to fill the seemingly insatiable demand from the country's metalworking plants.

The latest announcements assure the boosting of the nation's steel ingot capacity to slightly over the 117.5-million-ton mark. Capacity on Jan. 1, 1951, was 104,229,650 tons.

More, Maybe—Most of the expansions will be completed by the end of 1952. But that doesn't mean expansions will necessarily stop there. Speaking before the National Association of Home Builders, Herbert J. Watt, manager of sales, western area, United States Steel Co., said of the capacity expected by 1952: "If it develops that even this is not going to be enough, I am sure that further expansion plans will have been announced and will be underway."

In similar vein, E. G. Grace, chairman, Bethlehem Steel Co., said of his company's 2.6-million-ton expansion program: "It represents only what is immediately in prospect. We shall be prepared to build substantial additional capacities, if they are needed either for military purposes or for the general economy."

New Companies Too—Meanwhile a new steel plant at Clinton, Iowa, to be known as the North American Steel Co., also is being actively pushed. It recently bought a continuous billet mill rated at over 1 million tons annually. The mill was built by Mesta Machine Co., Pittsburgh.

In Virginia, a civic group is reported to be seeking an integrated steel plant on the James river.

Bethlehem Expands

Bethlehem's 2.6-million-ton program that Mr. Grace revealed is already partially completed, 1 million tons of it having become effective in the company's rated capacity as of Jan. 1 this year.

That leaves 1.6 million to be added yet: "These additions should be in full operation by the end of 1952, giving Bethlehem an annual rated capacity of 17.6 million tons," Mr. Grace explained.

The 2.6 million net tons in the program is distributed at Bethlehem's major steel plants like this: At Lackawanna, N. Y., 1,080,000 tons; Sparrows Point, Md., 740,000 tons; Steelton, Pa., 352,000 tons; Bethlehem, Pa., 188,000 tons; Johnstown, Pa., 180,000 tons; and Los Angeles, 60,000 tons.

$300-Million Job — Overall cost of this program is about $300 million. Bethlehem expects the government to grant it amortization certificates covering a substantial part of this expenditure.

To obtain this additional ingot capacity requires the building of steelmaking furnaces, blast furnaces, coke ovens and related equipment, transportation facilities and raw material supplies.

A new blast furnace with auxiliaries will be built at Lackawanna, and a sintering plant is authorized for Sparrows Point. Various improvements in blast furnace equipment were approved for Johnstown and Bethlehem last year.

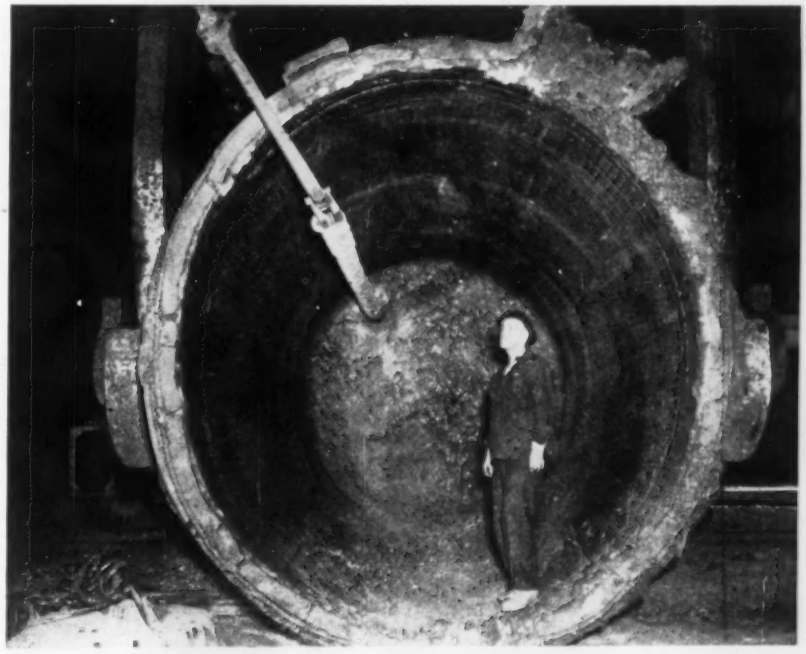
More Coke, Too—To provide fuel for the additional blast furnace capacity, a battery of 76 new coke ovens for Lackawanna and a battery of 65 for Sparrows Point are approved. Two 77-oven batteries were authorized last year for Johnstown.

Bethlehem's program includes as well the development or acquisition of iron ore, coal and limestone supplies to support the expanded production of iron and steel. To transport the additional tonnages of raw materials, the company has authorized purchase of new equipment and improvement of some of its existing facilities.

National Ups Its Goal

Further boost to the nation's steel ingot capacity comes from National Steel Corp.

It is expanding its expansion program and will get an additional 500,-



LARGER LADLE: Examining the brick lining of a 14-foot 6-inch high, 12-foot 3-inch diameter ladle is an employee of United States Steel Co.'s South Works, Chicago. Eighteen of these ladles were enlarged recently to hold 215 tons of molten steel. Former capacity was 192 tons. Changes were needed to accommodate increased output of the plant's open hearth furnaces

000 tons of capacity thereby. In earlier announcements National said it would increase its 4.5-million-ton ingot capacity to 5.5 million tons. Now it announces the capacity will be increased to 6 million tons. The entire increase is expected to be achieved by some time in 1952.

The 1.5-million-ton increase will be a 33⅓ per cent jump over the 1950 capacity of 4.5 million tons. Part of this 1.5-million-ton increase became effective as of Jan. 1, 1951, when National's ingot capacity was listed at 4,750,000 tons.

All for Present Plants—The 6-million-ton capacity figure, it is explained by Ernest T. Weir, chairman of National, does not include any tonnage that will be in the new plant to be constructed by National on the Delaware river, near Camden, N. J. It will result entirely from additions to and enlargement of blast furnace and open-hearth furnace facilities at the plants of Great Lakes Steel Corp., Detroit, and Weirton Steel Co., Weirton, W. Va.

When the program is completed, the annual ingot capacity of Great Lakes Steel will be 3.6 million tons and that of Weirton Steel will be 2.4 million.

Stacking Up—Under this program, Great Lakes Steel has begun construction of a fourth blast furnace on Zug island. The new stack will have an annual capacity of 500,000 tons.

Work of enlarging several of Great Lakes' open hearths from 250 to 500 tons capacity is underway.

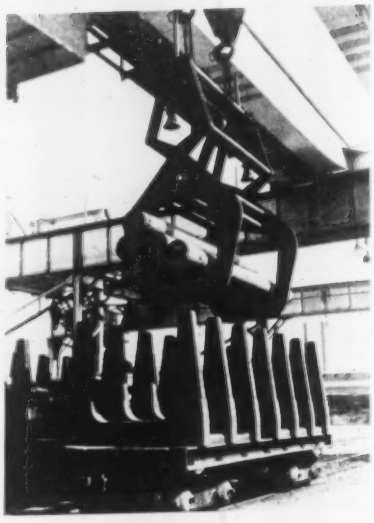
Great Lakes is also expanding its finishing capacity. "This month we hope to ship approximately 150,000 tons of cold-rolled sheets, and ultimately increase this to 200,000 tons a month," says George R. Fink, president of Great Lakes.

Electric Furnace Buyers

Electric furnace production facilities are sharing prominently in the unprecedented steel industry's expansion program.

Northwestern Steel & Wire Co., Sterling, Ill., ordered two 22-foot diameter hearth, top charge, three-electrode furnaces, rated at 125-130 tons capacity each. Those giants will furnish necessary steel for the 46-inch blooming mill the company recently purchased from United Engineering & Foundry Co., Pittsburgh.

Other electric furnace expansion programs include: Atlantic Steel Co., Atlanta, 18-foot diameter hearth, 75-ton capacity unit; two 20-foot hearth, 90-ton capacity units for Sheffield Steel Corp. at Houston, and Kansas City, Mo.; one 20-foot hearth, 90-ton capacity unit for Bethlehem Steel Co. at Los Angeles; and one 35-ton electric furnace unit for West Virginia Steel & Mfg. Co., Huntington, W. Va.



WORKING TOGETHER: Supplementing each other's functions are narrow gage stake cars and automatic tongs, both at work in the No. 4 blooming mill at National Tube Co.'s Lorain, O., works. The car transports 4 to 13-inch steel rounds from production run-out tables to stock conditioning beds or other finishing operations. The tongs, about to load a stake car, are controlled by the craneman. Made by Heppenstall Co., Pittsburgh, they make use of an automatic locking device that allows loading and unloading without ground crew assistance

Tennessee Steel Mill Planned

Plans of the recently incorporated Tennessee Steel Corp. call for two 25-ton top-charge electric furnaces and one smaller unit, to be located at Oneida, Tenn. Finishing facilities will include a bar and rod mill and a strip mill. Annual capacity is set at 100,000 tons, in addition to a rail rerolling and slitting mill of 36,000 tons capacity.

The company has applied to the National Security Resources Board for a certificate of necessity. Cost of the facility is estimated at $10 million. Dr. Huston St. Clair is president of the new company.

Politics in Steel?

WILL THE RUSH to Washington to obtain funds for building new steel plants throughout the country lay the groundwork for nationalization of the industry? This question is raised by Clarence B. Randall, Inland Steel president.

Amid the war hysteria, there is a serious danger of much political pressure to build plants where political purposes would best be served, Mr. Randall told the Investment Analysts Club of Chicago. "This might be the start of socialization or nationalization of the steel industry in this country."

Birdsboro To Build New Mill

Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., will build the new hot-rolling mill which Carpenter Steel Co., Reading, Pa., announced it will install (see STEEL, Jan. 22, p. 47).

The new mill will be a combination strip, bar and rod mill and will be completely designed, engineered and built by Birdsboro to special requirements of Carpenter. It will be unique in providing for substantial tonnages of these diverse products, while being arranged for maximum flexibility in changing to different orders. The most modern practices for assuring quality control will be used throughout.

The roughing unit will consist of one 2-high reversing and one 3-high mill. The strip mill will be of continuous 2-high construction. The bar mill will consist of 2-high mills served by mechanical transfers and manipulators. The rod mill will include several looping stands with repeaters and a continuous 4-stand mill for finishing down to ¼-inch rounds and small flats.

Mechanized handling equipment will be provided for all three classes of products.

The new mill will produce material for Carpenter's own cold-rolling and cold-drawing departments as well as products for direct sales as hot-rolled products, and will enable the plant to speed delivery to consumers.

Armco Awards Contracts

Contracts for a $35-million blast furnace and coke oven project at Middletown, O., for Armco Steel Corp. have been awarded. This project was announced last fall.

Arthur G. McKee & Co., Cleveland, will build the blast furnace, the Wilputte Coke Oven Division of Allied Chemical & Dye Corp. will construct 76 coke ovens and a by-products plant, and F. H. McGraw Construction Co., Middletown, will build railroad tracks, roads, sewers and other appurtenances.

Construction will start as soon as deliveries of steelwork and equipment can be made.

APRA for Aircraft

The Aircraft Production Resources Agency will help get the kinks out of airplane output

THE THOUSANDS of suppliers who will funnel components into the 50,000-planes-a-year aircraft program set up by the President received a boost last week when the Munitions Board established an Aircraft Production Resources Agency (APRA). Headquartering at Wright-Patterson Air Force Base, Dayton, O., it will act as a joint Army-Navy-Air Force organization to serve the military services and the aircraft industry.

APRA takes over and expands upon duties of the former Aircraft Scheduling Unit of the Munitions Board. It will consolidate requirements for materials and other resources needed in the combined military aircraft and associated programs. One of its major functions, aircraft manufacturers will be happy to learn, is to unravel production kinks arising from materials shortages and to prepare co-ordinated schedules for producing critical components and equipment.

Needed At Once—Wright Aeronautical Corp., Woodridge, N. J., a division of Curtiss-Wright Corp., is one of many aircraft producers that may be helped by APRA. Right now Wright has an advertising campaign going to get qualified subcontractors to fill its requirements for aluminum, magnesium and steel castings; engine subassemblies; gears; screw machine products; raw and finished aluminum forgings; fabricated sheet metal and stainless steel for which certified press and welding equipment are required; and hardened and ground parts—sources with carburizing and nitriding facilities preferred.

APRA will operate an agency of the military departments under the policy direction and control of MB. The Aircraft Scheduling Unit, superseded by the new organization, expedited the aircraft and production programs of the Army and Navy in World War II. Disbanded after the war, the unit was re-established by MB in 1948 with provisions for its expansion in an emergency.

Navy To Use Turbine Engines

Electric power for minesweepers will be supplied by lightweight gas turbine engines made by Boeing Airplane Co., Seattle. The turbine is of the same type that was installed experimentally in a Kenworth truck which has covered 5000 miles on a Cascade mountain trucking run. The 175-hp unit has been tested by Boeing in a 24-foot Navy personnel craft.

Several changes have been made in the engine: Reduction gear assembly has been modified, bearings and shaft enlarged, mounting frame lightened and circular exhaust outlets made to permit installation in a smaller space. Other applications are being considered by the Navy, Army and Air Force.

Pay Raise at North American

Workers at four Los Angeles plants of North American Aviation Inc. got a two-cents-an-hour cost of living increase; 20,000 found the addition in their paychecks as an adjustment based on the company's quarterly review of the Bureau of Labor Statistics cost of living figures. It is the first review made by North American since the program was started last October.

Lockheed Subcontracts Work

Components of the P2V Navy anti-submarine patrol plane have been subcontracted by Lockheed Aircraft Corp., Burbank, Calif., seven companies taking part at present. Kaiser-Frazer Corp. will fabricate and assemble fuselage waist sections and wing center section flaps at Oakland, Calif.

Drilling operations on main aileron spars for the plane began at Texas Engineering & Mfg. Co. Inc., Dallas, less than 20 hours after the fixtures were received from Lockheed's Burbank plant. Other contracts were made with Beech Aircraft Corp. and Cessna Aircraft Co., Wichita, Kans., Chance-Vought Aircraft, Dallas, Solar Aircraft Co., San Diego, Calif., and

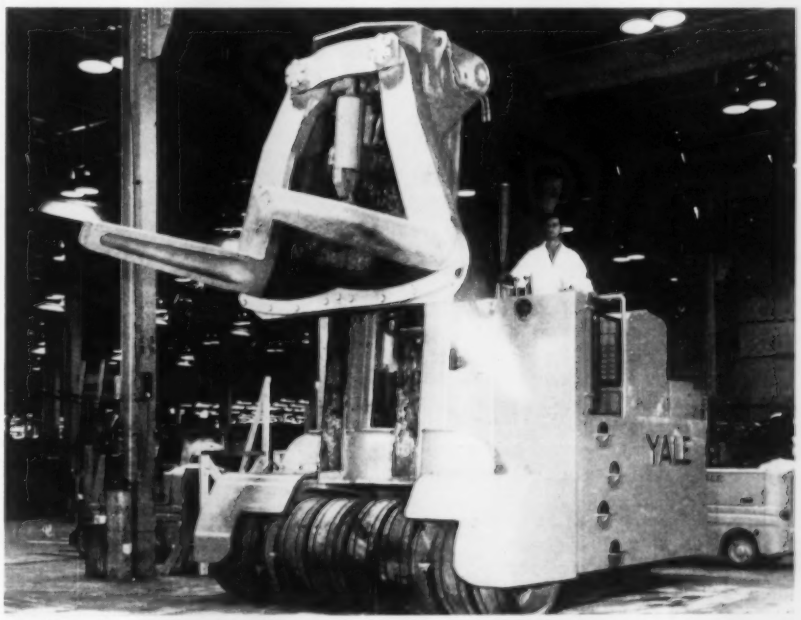
Giant Lift Truck To Speed Steel Production

THIS GIANT lift truck built by Yale & Towne Mfg. Co.'s Philadelphia Division will solve a materials handling problem in steel mills.

The unit has a capacity to lift 80,000 pounds and can carry one 80,000-pound coil of steel or two 30,000 or 40,000-pound coils around strip mills.

At some steel producers, 17 per cent of the entire rolling time for coils is now consumed in handling. Doubling the size of the coils handled is expected to slash handling time and improve quality and yield since the ends of coils rolled while the mill is accelerating and decelerating are often off-gage and rejected.

Weighing-in at 84,000 pounds, the new truck is powered by a diesel electric unit of the same size used in a 25-ton locomotive. Two snout-like rams on the front of the truck open and close like scissors. The unit has dual controls. The articulated construction of the drive and trailing wheels permits the truck to be operated on uneven floors.



YALE & TOWNE'S 84,000-POUND LIFT TRUCK

. . . snout-like rams that close like scissors reduce handling time

Rohr Aircraft Corp., also of San Diego.

Bendix Buys Ford Plant

Aircraft parts and accessories for the armed services will be built at Hamilton, O., by Bendix Aviation Corp., in a plant purchased from Ford Motor Co., Detroit. Used by Ford until recently for stamping operations, the plant will function as a Bendix division, says Malcolm P. Ferguson, president.

Plant contains 156,218 square feet of manufacturing space. It includes hydroelectric generating facilities and a 980-foot dam across the Great Miami river. About 2000 persons will be employed, with Henry G. Tarter, former Bendix Products Division executive, as general manager.

Landing Gear Program Expanded

Expansion of landing gear and other product output will be realized at the conclusion of a $2.5 million program under way at Cleveland Pneumatic Tool Co., Cleveland. Plant expansion, rearrangement and part of the required machine tools will be privately financed at a cost of $1 million. Remainder covers machine tools being acquired under a government facilities contract.

P & W Plans Training School

To train its new employees for their jobs, Pratt & Whitney Aircraft Division, United Aircraft Corp., East Hartford, Conn., is establishing a training school in the Taylor & Fenn Bldg., Hartford. Scheduled to open in March, the school will be able to accommodate between 600 and 800 trainees at one time. When full enrollment is attained, the school will operate on three shifts, with the same schedule as the plant.

Two Magnesium Plants Reopen

Velasco, Tex., and Manteca, Calif., are the locations of two additional magnesium plants to be reactivated. The Texas plant, under its World War II operator, Dow Chemical Co., Midland, Mich., will produce 160 million pounds of magnesium during the next two years. The other plant will be operated by Kaiser Magnesium Co.; production will start in July at the rate of 40 million pounds in the next two years. Kaiser operated this plant during the last war as Permanente Metals Corp.

Kaiser Aluminum & Chemical Corp. has contracted to supply the Manteca plant with ferrosilicon and calcined dolomite, magnesium components. It will reactivate its lime plant at Natividad, Calif., for this production.

Buys Plant for Defense Work

Arms Industries Inc., Youngstown, O., has purchased a plant at Columbiana, O., to be used in defense work. Formerly owned by Oaks & Burrows Inc., now out of business, the plant has 8000 square feet of floor area. Arms Industries is headed by M. I. Arms, also president of Arms Franklin Corp. of Youngstown.

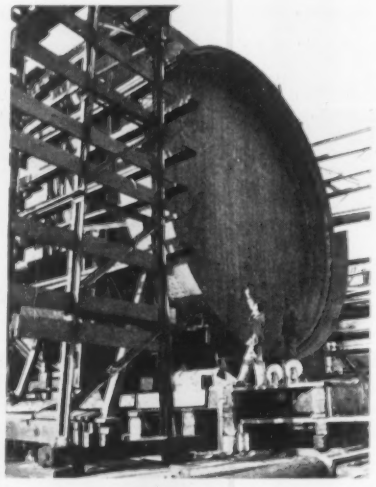
Yale-Towne To Squeeze Metals

Yale & Towne Mfg. Co., Stamford Division, is rescheduling its production of Yale locks and builders' hardware for consumer use. Raymond K. Watkins, Yale & Towne's sales manager, said the company will step up some lines of locks and hardware and drop others during the emergency to get maximum output from critical metals now restricted.

Production of the company's residential tubular locks will be confined to one new line, to be marketed soon as the Yale home duty tubular lock. Yale & Towne will also allocate its Yale locks and builders' hardware to all customers on an equitable basis.

Worthington Buys Pump Firm

Land, buildings and equipment of National Transit Pump & Machine Co., Oil City, Pa., are being acquired by Worthington Pump & Machinery Co., Harrison, N. J. The plant, covering about 500,000 square feet, will be utilized in the production of defense program equipment. National Transit Pump is being dissolved, but Worthington will furnish repair and spare parts for its equipment now in service.



TUNNEL LAUNCHING: Ready to be launched is this 300-foot tunnel section, built by Bethlehem at its Sparrows Point, Md., shipyards. After towing to Norfolk, Va., it will be joined by other sections underneath the Elizabeth river, connecting Portsmouth and Berkley, Va.

Brochure Asks for War Work

Everedy Co., Frederick, Md., a medium-sized company making home cooking equipment, is advertising its fitness to get prime or subcontracts in defense with a 18-page brochure.

The booklet details its production equipment, its peacetime and wartime performance in making both civilian and defense goods and other pertinent data.

Defense Data Compiled

Kansas City's Chamber of Commerce has compiled a book of data pertinent to 635 manufacturers in metropolitan Kansas City to help government procurement agencies seeking additional sources of supply and to assist prime contractors in finding subcontractors.

The manufacturers included in the book had responded to a chamber request for information concerning their plant and equipment.

Plant Expansion Up in '51

Building of war production facilities can be expected to increase in 1951, says R. D. Wood, president, American Institute of Steel Construction.

Mr. Wood predicts a rapid rebuilding of the nation's industrial plant if scarce building materials are allocated for these projects.

Mr. Wood says fabricating companies have enough orders to keep the industry busy for 7 or 8 months if steel is made available. Fabricators could use 3 million tons in 1951, as compared with less than 2 million tons in 1950.

Los Angeles Adds 128 Plants

Private capital investment of over $98.3 million was required for establishment of 128 new factories and expansion of facilities at 399 existing plants in Los Angeles in 1950. This growth created 14,987 jobs, says the Los Angeles Chamber of Commerce industrial development committee. Manufacturing gains created 90,000 additional nonmanufacturing jobs, the committee indicated.

Avoid the Five Percenters

You don't need special agents to get government business. You can get it yourself

You don't need "five percenters" to get government business.

"Five percenters," special agents who offer to get you government business for a fee, are bobbing up in increasing numbers, observes Brig. Gen. David J. Crawford, commanding general of the Ordnance Tank-Automotive Center, Detroit.

"Such persons are not able to obtain any contracts which could not be obtained by the companies themselves," General Crawford points out.

Government procurement, he explains, is governed by the Armed Forces Procurement Regulation, which applies to the Army, Navy and Air Force. Manufacturers and dealers who wish to do business with the government should write directly to the appropriate purchasing office, General Crawford says.

Aluminum: New Developments

What's new in the aluminum field?

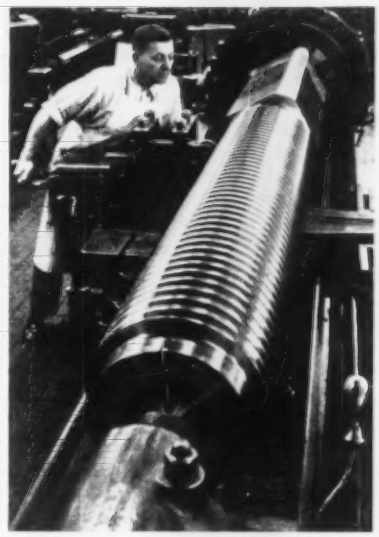
Aluminum Co. of American reveals four things:

1. The company expects to complete installation of a 15,000-metric-ton vertical forging press in the coming summer at its Cleveland plant. The press, obtained from Germany, will be of five times greater capacity than any previously used by Alcoa and will make possible the manufacture of very large metal forgings. The unit is expected to make possible the production of group forgings at an exceptionally fast pace, particularly for aircraft.

2. A sheet alloy for thinner steel-backed aluminum bearings has been developed by the company. Aluminum cast bearings have in many instances been limited to applications where there was sufficient space to install them. This new development is expected to widen the use of aluminum bearings.

3. Rolled tapered aluminum sheets are now being produced on a semi-commercial basis by Aluminum Co. of America at Alcoa, Tenn.

4. The company has developed double-wall impact extrusions. Centrally located internal hollow tube is extruded integrally with the rest of the shell. Applications to date for these extrusions include Navy signal flares and other military uses. Announcement of a number of commercial applications is expected to follow soon.



HARDLY A WATCH PART: A 15-inch diameter thread is being rolled on a 13-foot screw at Ford Motor Co., Dearborn, Mich. Performed with watchmaking precision, the thread-rolling process closes pores in the metal to give the thread a better surface finish to reduce frictional wear. Screw is used to control roll adjustments in the company's steel rolling mill

Steel Equipment Goes to Japan

Equipment for rehabilitating the Japanese steel industry is being built at Aetna-Standard Engineering Co., Youngstown, O., and United Engineering & Foundry Co., Pittsburgh, for Toyo, Kohan Co. Ltd., Tokyo. United is making a unit for cold rolling strip for tin plate; Aetna-Standard's order calls for a pickling unit for modernizing dip tinning units. The United machine will have an annual capacity of 50,000 tons, half of the country's 1951 tin plate production.

Cincinnati Milling Builds

Both the foundry and machine shop of Cincinnati Milling Machine Co., Cincinnati, O., will be expanded, the total program to cost $440,000. The foundry addition will be 140 x 270 feet, while the machine shop will be enlarged by 105 x 300 feet. Both additions will adjoin present facilities.

Only Stefco Plant Sold

Cribben & Sexton Co., Chicago, is taking over only the plant of Stefco Steel Co., Michigan City, Ind. It is not purchasing the Stefco organization, as reported in STEEL, Jan. 15, p. 84.

Ford Orders Ore Boat

Great Lakes Engineering Works, River Rouge, Mich., got the contract to build a 647-foot ore carrier for Ford Motor Co. The boat is the third in the Ford fleet and is to be ready for the start of the 1953 navigating season. It is the eleventh Great Lakes carrier ordered in recent months (STEEL, Dec. 4, p. 66).

The vessel will be powered by a 7000-horsepower oil-fired turbine and will have a capacity of 19,000 gross tons. She will be named the *William C. Ford*, after the youngest of the three Ford brothers.

Line Material Builds in Texas

Line Material Co., Milwaukee, Wis., will build a 30,000 square foot plant in northern Texas at Sherman. The McGraw Electric Co. division, makers of electrical distribution equipment, will employ 80 persons at the new plant. The company also has completed a 21,000 square foot wing on its South Milwaukee plant.

Acme Steel Gets Cor-Ten License

Acme Steel Co., Chicago, has been awarded a license by United States Steel Co., Pittsburgh, to manufacture "Cor-Ten", corrosion resistant, low-alloy steel developed by Carnegie Illinois Steel Corp. Announcement of the new license was made last week by J. Douglas Darby, vice president, sales, U. S. Steel. The six other domestic producers of "Cor-Ten" include Republic Steel, Lukens Steel, Crucible Steel Company of America, Inland Steel, Sharon Steel, and Greer Steel.

Wilson-Snyder Expands Line

Wilson-Snyder Mfg. Division, Oil Well Supply Co., will expand its line of centrifugal pumps, says Charles H. Stewart, works manager of the United States Steel plant in Braddock, Pa. Line will be increased by 19 general purpose centrifugal pumps ranging from 5 to 250 hp.

Bethlehem Supply Co.'s Merged

Bethlehem Steel Corp. now operates its two oil field supply companies under one management. The Bethlehem Supply Co. of California becomes an integral part of the Bethlehem Supply Co., with headquarters in Tulsa, Okla. The present unified supply organization includes fifty field stores and two manufacturing plants, the latter located at Corsicana, Tex., and Tulsa, producing a complete line of drilling and producing machinery.

Question of Questionnaires

Advisory Council on Federal Reports seeks to raise standards of U. S. questionnaires

DIKES are being built to restrain the flood of government questionnaires that nearly swamped business during World War II.

The Advisory Council on Federal Reports has submitted to the government a list of practices to be avoided in the preparation of federal reporting forms, with particular reference to emergency agencies. The U. S. says it will try to abide by the suggestions of the council, which is a group appointed jointly by national business organizations at the request of the Bureau of the Budget. Its purpose is to advise the bureau in simplifying and improving questionnaire and reporting procedures of Federal agencies.

The council recommends that the U. S.:

1. Ask only for information readily available to the respondent. WPB in World War II requested that each shipper of a specified material report the "end-use" of that material. The shipper often does not know the end-use to which the material is to be put.

2. Ask only for data that can be prepared by standard accounting processes. Requests for information should rely upon summaries regularly prepared for internal business use.

3. Avoid questionnaires that don't take into account the limitations of the records of the small respondents.

4. Avoid questionnaires that fail to allow for the specialization or location of records of large respondents. Some big companies may have labor information in one city and production data in another. A single form combining both those classes of information results in needless delay and unnecessary burden to the respondent.

5. Avoid making requests for information retroactive to periods too far in the past.

6. Avoid asking for the listing of individual transactions.

7. Avoid reports intended to determine whether a respondent is violating a regulation or to induce a violator to attest to his own violation. The council says: "Experience shows that compliance is seldom achieved merely by accumulating and shuffling papers. Violators are not likely to admit violations in reports. Even if they do, the most that paper work would prove would be their names. It is still necessary to make a field investigation." The council believes that compliance questionnaires could be eliminated entirely if the federal agency concerned put plants on notice that they must keep specified records on operations available to accredited inspectors on an "if, as and when" basis.

8. Avoid questionnaires that convey information to management or that stimulate management to an awareness of a government agency, its policy or its regulations. Reporting forms should be used exclusively to provide agencies with data for which there is a demonstrable need.

9. Never let a questionnaire fall below the established standards for physical makeup. The form should always include agency identification and return address, Budget Bureau approval number, authority or basis for collection, confidential clause and instructions.

10. Avoid issuance of new reporting forms and new reporting and record-keeping requirements that are not accompanied by a statement as to the intended uses to which the data will be put.

11. Avoid making requests for information when government facilities for processing such requests are not available.

12. Avoid collaborating in the collection of data with a business group such as a trade association until the Budget Bureau has approved the questionnaire being "sponsored" by a federal agency. Some cases have arisen where trade associations issued questionnaires alleged to have been sponsored by a federal agency but which did not bear the Budget Bureau approval. Such approval is required under the Federal Reports Act of 1942.

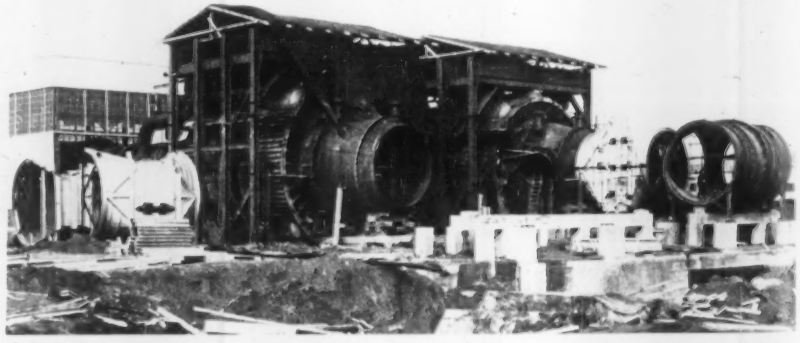
A Decade of Flight Testing on the Ground

MATURING from an original authorized plant cost in 1941 of $8.4 million and 300 employees to a current plant value of $85 million with 3000 employees, the Lewis Flight Propulsion Laboratory of the National Advisory Committee for Aeronautics, located on a 200-acre site adjoining the Cleveland airport, last week commemorated ten years of operation. Appropriate ceremonies were sponsored by the Cleveland Chamber of Commerce: 1000 luncheon guests heard remarks from Dr. Hugh L. Dryden, director of NACA.

The laboratory has expanded from an original 12 buildings to 77 units, including many that are the only ones of their kind in the world, such as the 8x6-foot supersonic wind tunnel, and an altitude wind tunnel for testing full-size jet engines under conditions simulating 50,000-foot altitude. Power requirements for operating all facilities have stepped up from 50,000 to 350,000 kw. Scheduled for early construction is a new supersonic wind tunnel, more powerful and larger than the present design.

Dr. Dryden centered his comments on jet engines for military aircraft and the types of basic research involved in their refinement. He likened today's jets to a young man who is full grown but not yet emerged from adolescence, calling for specialized studies, particularly in the fields of physics and metallurgy.

Characteristics of structural materials—metals, alloys, ceramels, cermets—for operating at temperatures



FOR FUTURE JETS: Research on the most powerful existing or planned jet engines will be carried on in this new propulsion sciences laboratory to be completed at Lewis Flight Propulsion Laboratory, Cleveland, within a year. The total cost of this facility, $15 million, is almost twice the entire appropriation for the original establishment a decade ago

Dr. Hugh L. Dryden, for 19 years with the Bureau of Standards, has been director of the National Advisory Committee for Aeronautics since 1947. He is the 1950 Daniel Guggenheim medalist for his contributions to the advancement of basic air research

of 1500 to as high as 3000 degrees F must be determined, not only to improve present turbojet engines but to point the way to reductions in the amounts of strategic materials used in their manufacture. These include columbium, cobalt, tungsten, chromium and nickel.

Some of the alloys currently being used for gas turbine blades are more than 90 per cent strategic material in content, and it may be possible to reduce this proportion importantly. Internal cooling of hollow blades with air or liquid is being investigated.

The NACA laboratories, Lewis at Cleveland, Langley in Virginia and Ames in California, work in close co-operation with the manufacturer-military-research team, and their findings are reported regularly to the team members in the interests of building better, faster, higher-climbing, safer more economical airplanes.

ASTE Covers Tooling Advances

Over 30 "production know-how" papers are scheduled for presentation at the 19th annual meeting of the American Society of Tool Engineers in New York, March 15 to 17. On the agenda are five papers on press-working of metals, eight on machining, six on inspection and quality control and eight on tooling. Thirty-three papers are scheduled thus far.

Blast Furnace Output Rises

Blast furnace production in 1950 was 20 per cent over that of 1949.

The American Iron & Steel Institute reports the 1950 output as 65,484,168 tons, compared with 54,206,343 in 1949. In 1950 the furnaces operated at an average of 91.5 per cent of capacity.

The 1950 production consisted of 64,810,272 tons of pig iron and 673,896 tons of ferromanganese and spiegel. The 1949 breakdown was 53,613,779 tons of iron and 592,564 tons of spiegel.

In December, pig iron production totaled 5,628,426 tons, compared with 5,330,850 in November; ferromanganese and spiegel output was 64,607 tons, compared with 55,988 tons.

Name Scrap Safety Winner

Iron & Steel Products Inc., Chicago, won the 1950 safety contest sponsored throughout the scrap iron industry by the Institute of Scrap Iron and Steel. The winning Chicago firm was credited with 44,690 man-hours without a reportable accident in competition with firms having 11 or more employees.

Annual Reports: Plain or Fancy?

You may be wasting your energies in working up a fancy stockholders' report. A survey by Allegheny Ludlum Steel Corp. reveals that its stockholders perfer to get their facts and figures without the fancy trimmings that have become a trend in the publication of annual reports.

Tucked away on the back inside page of Allegheny Ludlum's regular quarterly publication mailed to its 13,304 stockholders with their dividend checks on Dec. 21, 1950, was this item: "Included herewith is a post card upon which each stockholder is requested to designate whether he prefers a colorful, well-illustrated report; a one-color, factual report; or financial statistics and auditors' letter only."

To date, 24.5 per cent of all stockholders have answered; 54.7 per cent of those answering prefer the plain, factual report; 13.3 per cent want the statistics and auditors' letter only; 29.6 per cent want the full report.

18 TO FOLLOW: This 300-foot simple deck truss span is the first of 19 spans to be floated into position on the concrete piers of a bridge across Chesapeake bay north of Annapolis, Md. Erection is being performed by Bethlehem Steel Co., Bethlehem, Pa. The span was removed from the barge by pumping out the water ballast to lift it, then shifting the 967-ton load to the proper place over the piers. Span is 150 feet above the water

CHECKLIST ON CONTROLS

Materials Orders

LEATHER—M-28 provides that defense orders for certain types of leather be distributed equitably among leather producers. NPA Order M-28. Effective Jan. 17, 1951.

HORSEHIDE FRONTS, DEERSKINS—M-29 reserves for defense rated orders the leather produced from horsehide fronts and deerskins. NPA order M-29. Effective Jan. 17, 1951.

TUNGSTEN—M-30 allocates all forms of tungsten—except tungsten ores, concentrates and scrap—based on end-use essentiality beginning Mar. 1. It limits the use of tungsten in grinding wheels and restricts the purchase, sale and use of tungsten steels. NPA Order M-30. Effective Jan. 22, 1951.

CHLORINE—M-31 is designed to fill public health needs for chlorine. NPA Order M-31. Effective Jan. 23, 1951.

CHEMICALS—M-32 limits the amount of production ethyl cellulose producers must devote to rated orders. NPA Order M-32. Effective Jan. 23, 1951.

STEEL — Supplement 1 to M-1 as amended Jan. 17, 1951, establishes a procedure to assure prompt delivery of steel for the railroad freight car program.

STEEL—Amendment on Jan. 22, 1951, of NPA Order M-1 requires mills to increase the percentages of steel they set aside for defense rated orders, establishes specific inventory controls, brings additional products under M-1, establishes minimum mill quantities, and increases lead times. NPA Order M-1, as amended Jan. 22, 1951. Effective Jan. 22, 1951.

NICKEL—Amendment Jan. 23, 1951, of NPA Order M-14 lists a wide range of products in which the use of nickel silver and nickel plate will be prohibited after Mar. 1 and nickel bearing stainless steel or high-content nickel alloys prohibited after Apr. 1. NPA Order M-14, as amended Jan. 23, 1951. Effective Jan. 23, 1951.

ALUMINUM — Amendment Jan. 23, 1951, of NPA Order M-22 postpones the effective date of certain provisions of M-22 (aluminum scrap order) until Mar. 1 to permit inclusion of additional firms to process aluminum scrap. NPA Order M-22, as amended Jan. 23, 1951.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Keep defense production paramount but don't let it interfere any more than's necessary with the country's normal domestic economy, Big Three mobilizers advocate

Latest utterances by the Big Three in the defense mobilization picture—President Truman, Charles E. Wilson, and Gen. W. H. Harrison—reveal this fundamental thinking: Defense production continues of paramount importance but it must not be allowed to interfere with the normal domestic economy any more than is absolutely necessary. That end can be achieved by stepping up even further the capacity to produce such basic materials as steel, copper, zinc, etc., by considering the overall manpower situation in supervising procurement, and by obtaining widest possible participation of industry generally in defense work through the placing of subcontracts, also prime contracts, with small business.

About Face—In addition, there has been a definite reversal from the previous seeming indifference to inflation. When President Truman spoke before the Society of Business Magazine Editors, he, for the first time, ranked the danger from inflation as equal to the danger from aggressors.

The current ambition to rearm the country without seriously cutting into civilian production programs has thrown some more cold water—at least for the time being—on prospects for early end-use limitations on steel and early adoption of a Controlled Materials Plan.

Hopeful—Discussing steel, aluminum and copper before the Senate Small Business Committee, Mr. Wilson predicted "the steel shortage won't be too serious if we get these new facilities." Outlook, he said, is that copper supply will be easier than aluminum, and that aluminum supply will be easier than steel—on the basis of the expansion timetable.

Gird for Manpower Problems . . .

Anticipating manpower troubles under the rapidly developing defense production program, Labor Department's Bureau of Employment Security is prepared to enlarge its 13 regional staffs as soon as the Budget Bureau allots it the necessary funds.

Main objective is to provide good men to serve as chairmen of the area management-labor committees to be formed to handle manpower problems as and where they develop. Eventually there are to be 151 of these area committees, to be composed equally of management and labor union representatives in each area; the committees will be set up as needed. The first ones will be organized at Seattle, San Francisco, Chicago, Cleveland, and in the Indiana centers of Evansville, Ft. Wayne, Indianapolis and South Bend.

The whole program is under the National Management-Labor Committee on Defense Manpower, of which Secretary Tobin is chairman. Management members so far appointed are: Otto A. Seyferth, president, Chamber of Commerce of the United States; Claude A. Putnam, National Association of Manufacturers; Elwood L. Chase, Cooperative GLF Exchange Inc., Buffalo; Arthur M. Hill, president, National Association of Motor Bus Operators; J. L. Levett, general manager, Michigan Manufacturers Association; Douglas Rowell, general manager, American Brass Co., Kenoosha, Wis.

Four Get Lift from RFC . . .

Recent loans of interest to the metals industries by Reconstruction Finance Corp. include the following:

Pacific States Steel Corp., Niles, Calif., $1,084,000, for debt payment, to mature in eight years.

Vinnell Co. Inc., Alhambra, Calif., general contractor and steel fabricator, $1 million for working capital and debt payment, five years.

Fenn Mfg. Co., Hartford, Conn., manufacturer of precision machine tools and special machinery, $650,000 for working capital, ten years.

Connecticut Telephone and Electric Corp., Meriden, Conn., manufacturer of signaling equipment, $8 million working capital, one year.

Two More Mobilizers . . .

Roger Allen and David H. Duff have joined the Ferroalloys Section, Iron and Steel Division, National Production Authority—the former as consultant to Dr. James H. Critchett, chief, and the latter as a member of Dr. Critchett's staff.

Stronger Munitions Board . . .

Reorganization of the Munitions Board has created a separate office for stockpiling of critical materials. Changes wrought will strengthen the organization and will make possible placing top-flight businessmen on its staff, says John D. Small, chairman.

NPA Iron & Steel Division Personnel

(As of Jan. 22, 1951)

All callers should seek interviews through Room 3814A Commerce Building. Telephone calls should be made through STerling 9200 Extension 2951.

Director: David B. Carson

Assistant to Director: Frank T. McCue

Staff Assistants: Jacob Levin, Richard X. McGowan, Robert M. Weidenhammer, E. S. Moorhead, Leslie L. Pitchford Jr., Hugh O'Neill

Correspondence Clerk: Kathleen Cockrum

Legal Counsel: Richardson Bronson

International Economist: J. Joseph W. Palmer; Assistant, Dean Peterson

Wire Section: Chief, Norman Melville

Pipe and Tube Section: Chief, A. P. Happer

Priorities and Statistical Control Section: Chief, Kenneth H. Hunter

Plant Expansion Section: Chief, H. L. Leyda

Sheet and Strip Section: Chief, W. B. Quail; Assistants, Milton Englert, William R. Nolan

Bars and Semifinished Section: Chief, J. W. Robinson; Assistant, George L. Anderson

Warehouse Section: Chief, Russell Link; Assistant, Charles Kramer

Forgings Section: Chief, H. F. Weaver; Assistant, J. E. Sweeney

Castings Section: Chief, A. J. McDonald

Refractories Section: Chief, Marguerite M. Sauers

Ferroalloys Section: Chief, James H. Critchett; Assistants, Edwin K. Jenckes, P. A. R. Reinertsen, Harold Larson, Roger Allen, David H. Duff

Scrap Section: Chief, Marvin S. Plant; Assistant, Charles M. Brooks

Stainless Steel Section: Chief, C. B. Boyne

Pig Iron Section: Chief, John A. Claussen

Alloy and Cold Drawn Bar Section: Chief, L. E. Creighton, John J. Boylan, George Sands, Felix Kremp, Veryl Graze

Rails and Accessories Section: Chief, John J. Davis

Programs Section: Chief, Charles Halcomb; Assistant, Schuyler C. Wardrip

Tin Plate Section: Chief, Arthur M. Long

Structural Shapes Section: Chief, R. A. Marble

Plate Section: Chief, W. E. Mullestein; Assistant, William E. Bossert

Auxiliary Products Branch: Acting Chief, Lindsey Howell

What Output Aid from U. S. Allies?

The U. S. can look to its allies for some production help ahead, particularly to relieve materials shortages in American industry

WHAT production help can the U. S. expect from its allies in the industrial mobilization against Communism?

One kind of aid will be on a private basis as individual American companies turn to foreign sources for scarce materials. A way to learn what foreign producers have to sell is through the international fairs. The most important ones scheduled for the next eight months are listed below.

Output Booster—A second form of help may come through co-operation among the Allies to expand production. The U. S. is inviting friendly governments to take part in creating commodity control groups for rubber, tin and other scarce materials. Six or more groups are expected to be set up in February. The number may be expanded to as many as 20 later on. Most will have headquarters in Washington. The separate commodity groups will recommend specific action by the co-operating governments. No policy has yet been announced about controlling prices, which for some commodities have soared to record heights.

U. S. Defense Boss Charles E. Wilson has established a Committee on Foreign Supplies & Requirements and named William C. Foster, ECA administrator, as its chairman. The committee will represent Mr. Wilson in guiding American representatives abroad on policies and programs of the Office of Defense Mobilization.

Indirect Aid—A third kind of assistance from allies will be less direct: Rising industrial production abroad will make less drain on American output. The countries of Europe, not counting the Soviet Union, are expected to produce 57.2 million net tons of pig iron and 75.9 million tons of ingot steel in 1951. That compares with an estimated output in 1950 of about 47.6 million tons of pig iron and 66.4 million tons of ingots. In 1949 Europe produced 44.4 million tons of pig iron and 61.1 million tons of ingots.

Canadian Mobilization Gains

Canada's government arsenals are slowly gathering steam. For 1950 they produced $10.8 million worth of armament and will turn out three to five times that amount in 1951.

The heaviest concentration in 1951 production will be in development of radar and the 155-millimeter gun, a U. S. artillery piece. Soon to be approved will be a multimillion-dollar retooling program to re-animate plants now functioning in low gear. More millions will be set aside for resumption of giant armament production in Canada.

Coupled with those moves is one to expand electronics production facilities with the construction of a $2 million plant in Toronto. That development is still in initial stages.

Despite promising prospects for armament production in Canada, arsenals still can absorb more orders than they are getting. Some of them are working at only 10 per cent of capacity. Canada hopes to interest the U. S. in placing more defense orders in the dominion.

U. K. Defense Work Increases

The tide of armament work to British manufacturers is increasing.

Employment in the vehicle and machinery industries—which thus far have borne the brunt of the defense program—has increased by about 100,000 compared with a year ago, and now more than 4 million people are employed in those groups. One large order has been for 7000 Army vehicles. Civilian auto output may be cut 15 to 20 per cent in 1951. Plans are shaping up for a priority program to enable defense producers to get sheet steel.

British steel exports to the U. S are not expected to increase significantly in 1951 compared with 1950, but shipments to other areas—notably Canada—which use large quantities of American steel are likely to rise. In the first 11 months of 1950, a record 3,171,762 net tons of steel were exported from the United Kingdom, compared with 2,429,441 tons in the same 1949 period.

Politics Hinders Ruhr Output

The political question of German rearmament has complicated the Ruhr's mobilization efforts. The Germans claim that Allied dictates on coal, scrap and steel exports have minimized the contributions they could make.

The German scrap trade has collected 16.5 million tons of scrap iron since the war, of which 6.6 million tons were exported. The bulk of the "blitz" scrap from bombed cities has not been collected.

Only normal scrap supplies resulting from normal industrial operations will be available in the future; hence, the necessity of forming a new scrap allocation office which will centralize all requirements and collections beginning Feb. 15. Scrap iron collections shrank from 770,000 tons in July to only 330,000 tons in Decem-

What's Europe Got To Sell? Find Out at Fairs

Feb. 2-6—Electronic Exhibition, Paris
Feb. 9-18—Technical Fair, Copenhagen
Feb. 11-18—Agricultural Products Machinery Exhibition, Brussels
Feb. 27-Mar. 4—Agricultural Machinery Exposition, Paris
Feb. 28-Mar. 4—Light Industries Fair, Hanover, Germany
Mar. 1-Apr. 7—Railroad, Industry & Economy Exposition, Santiago, Chile
Mar. 2-11—Commercial Fair, Copenhagen
Mar. 4-11—Leipzig Trade Fair, Leipzig, Germany
Mar. 6-14—Trade Fair, Cologne, Germany
Mar. 8-18—Automobile Show, Geneva
Mar. 11-16—Trade Fair, Frankfort, Germany
Mar. 11-17—International Industrial Exposition, Houston
Mar. 11-18—Trade Fair, Vienna
Mar. 27-Apr. 1—Agricultural Machinery Exhibition, Toulouse, France
Mar. 31-Apr. 9—Trade Fair, Lyon, France
Apr. 3-12—Industries Fair, Utrecht, The Netherlands
Apr. 4-15—Automobile Exhibition, Turin, Italy
Apr. 7-17—Swiss Industries Fair, Basel
Apr. 12-29—Trade Fair, Milan, Italy
Apr. 19-29—Automobile Exhibition, Frankfort, Germany
Apr. 21-May 6—Trade Fair, Brussels
Apr. 21-May 6—Trade Fair, Liege, Belgium
Apr. 28-May 6—Trade Fair, Graz, Austria
Apr. 28-May 14—Trade Fair, Paris
Apr. 29-May 8—Heavy Industries Fair, Hanover, Germany
Apr. 29-May 14—Trade Fair, Poznan, Poland
Apr. 30-May 11—British Industries Fair, London Birmingham
Aug. 20-Sept. 20—Trade Fair, Izmir, Turkey
Aug. 24-Sept. 2—Trade Fair, Innsbruck, Austria
Aug. 25-Sept. 9—St. Erik's Trade Fair, Stockholm
Sept. 1-10—Machine Tool Exhibition, Paris
Sept. 1-16—Trade Fair, Strasbourg, France
Sept. 2-6—Trade Fair, Frankfort, Germany
Sept. 2-7—Leipzig Trade Fair, Leipzig, Germany
Sept. 8-23—International Trade Fair, Chicago
Sept. 8-23—Industries Fair, Ghent, Belgium
Sept. 8-23—Swiss National Fair, Lausanne
Sept. 8-25—Levant Fair, Bari, Italy
Sept. 9-16—Trade Fair, Vienna, Austria
Sept. 10-14—International Instrument Conference & Exhibit, Houston
Sept. 11-20—Industries Fair, Utrecht, The Netherlands
Sept. 15-Oct. 1—Trade Fair, Marseille, France
Sept. 16-18—Trade Fair, Cologne, Germany
Sept. 29-Oct. 7—Trade Fair, Graz, Austria

Additional information about these fairs may be had from the compiler of the data, Walter Haidar, Fairs & Exhibitions Branch of the Commerce Department's Office of International Trade, Washington 25.

ber. Despite reduced scrap receipts, dealers still have heavy export orders. The average scrap price paid by U. S. buyers f.o.b. western European ports is around $33.

Allied orders now force German coal producers to ship about 25 per cent of their output abroad a month. The result, say Ruhr industrialists, is a coke shortage which hampers steel output. Steel mills need 10 to 20 per cent more coke to operate at capacity. Scrap shortages, too, are cutting production.

As a result, say the Germans, they are having trouble in meeting the mandatory steel requirements placed by the occupation powers. The Allies have been earmarking more and more steel, particularly plates and sheets, for export to other Western nations for ultimate fabrication into munitions.

U. S.: Buyer of Belgian Steel

The U. S. has become one of Belguim's largest steel customers.

The nation's steel output is at a rate of nearly 450,000 net tons monthly. Some 49 blast furnaces are operating in Belgium; 24 in Luxemburg. Export prices are high, and deliveries are extended, but still the orders pour in.

A new mill for coils and sheets has been installed at the works of Societe d'Esperance-Longdoz.

Norway Chalks Up Records

Norwegian industrial production in 1950 was 7 per cent above 1949 and 40 per cent higher than in 1938. Employment last year was about 2.8 per cent greater than in 1949.

Norway's exports rose 27.8 per cent in 1950 over 1949, but imports climbed, too—19.5 per cent.

Italian Output Soars

Since 1948 there has been a 50 per cent increase in Italian production of autos, busses and trucks. Italian workmen have built 62 per cent more buildings; industrial production has gone up 18 per cent; agricultural, 6 per cent.

Australia Needs More Lead

One of Australia's most perplexing shortages is lead, even though it exports large tonnages of the metal annually.

Explanation of the paradox is this: Export prices are in some cases higher than domestic; domestic consumers are hoarding. Normal domestic use of primary lead is about 35,000 tons. In 1950 consumption rose to an estimated 45,000 tons.

Wide World

THROUGH THE TORRID ZONE: Heavy U. S. Pershing tanks appear in Berlin for the first time since 1945 after being unloaded at the Grunewald Freight Station in mid-January. Included in the shipment were 22 tanks, brought through the Russian Zone—without incident—to be used to train the U.S. Sixth Infantry

New Cobalt Sources

Recovery of cobalt from ores previously considered uneconomical to process now feasible

A NEW PROCESS for recovering cobalt from domestic ores will add 4.5 million pounds of the critical material to industrial stockpiles by the end of 1952. Usually a byproduct of some other metal, it previously has been difficult to separate from nickel and arsenic, frequently found with it in this country and Canada.

Developed by Chemical Construction Co., New York, the new process will produce cobalt at three new refineries at Salmon, Idaho, Fredricktown, Mo., and Cobalt, Ontario. *Mining Engineering*, publication of the Mining Branch, American Institute of Mining and Metallurgical Engineers, says the process is the first feasible commercial exploitation of these cobalt resources.

Everybody Uses It—U. S. consumption of cobalt was 8 million pounds yearly prior to the present national emergency. Largest use is in permanent magnets. It also improves cutting performance of tool steels at high speeds and red heats. Refractory or high temperature alloys capable of maintaining strength at operating temperatures over 1600° F demand its use. Frit or ground coats in porcelain enamelware use cobalt oxide; paints and varnishes use cobalt salts as a drier. Unusual uses include supplement to pasture deficiencies in cattle raising and providing the blue color in ceramics.

Ninety per cent of our cobalt has come from the Belgian Congo, originating as a by-product of copper refining. The additional 4.5 million pounds from domestic sources and 2 million pounds expected from French Morocco ores means the United States should have available annually the following amounts by the end of 1952:

Belgian Congo	7.5 million lb.
French Morocco	1.0 million lb.
Idaho	3.0 million lb.
Missouri	.5 million lb.
Cobalt, Ont.	.75 million lb.

for a total of 12.75 million pounds.

Rockwell Moves Into Barberton

Rockwell Mfg. Co., Pittsburgh, acquired both the Pittsburgh Valve and Fittings Division of Pitcairn Corp. and the Pittsburgh Valve and Fittings Corp., subsidiary of Pitcairn Corp. W. F. Rockwell Jr., president, Rockwell Mfg. Co., says his company paid $3 million in the cash and stock transfer deal.

Manufacturing facilities and principal offices of Pittsburgh Valve are located in Barberton, O., with company-owned warehouses also acquired in Kansas City and Houston. The plant occupies a total of 400,000

sq. ft. of floor space and is located on a 38-acre tract. Mr. Rockwell says his company will expand the Bellerton operation to its limit.

US Pipe Co. Gets Pontusco Corp.

United States Pipe & Foundry Company, Burlington, New Jersey, has announced acquisition of complete ownership of Pontusco Corp., formerly controlled jointly by US Pipe and Foundry Company and Compagnie de Pont-a-Mousson of Nancy, France. Pontusco Corp. is owner of all the common stock in the United Concrete Pipe Corp. of California. Under the agreement, the French company gains control of Pontusco Corp. of Cuba and will operate a concrete pipe plant at El Cotorro, Havana.

Barnett Foundry Acquires Plant

The plant of Downs-Slater Foundry Co., Dover, N. J., is to be devoted entirely to production of Meehanite castings. It was acquired by Barnett Foundry & Machine Co., Irvington, N. J.

Ferguson Expands for Research

An engineering and research laboratory costing $500,000 is being built by Harry Ferguson Inc., Detroit. Building will have 50,000 square feet of floor space. Ferguson is now producing 175 farm tractors a day.

Hayes Acquires Skyline Corp.

Hayes Mfg. Corp., Grand Rapids, Mich., has acquired the holdings of Allan P. Kirby, New York capitalist, in Skyline Corp., Wichita, Kan., manufacturer of agricultural implements. Also purchased was Skyline's 60 per cent interest in Aircraft Armament Inc., Baltimore, Md., an engineering firm. Rensselaer W. Clark, president of Hayes, is the new chairman of Skyline's board of directors.

Cummins Expands Second Time

Cummins Engine Co. Inc., Columbus, Ind., will spend $400,000 on an addition for its fuel pump building which was completed a year and a half ago.

The 9600-square-foot addition, says R. E. Huthsteiner, executive vice president, follows building of a stores center building of 200 x 460 feet, started last September. All of the new facilities will increase plant size more than 30 per cent.

Norgren Celebrates and Builds

Production facilities more than doubling present plant output will be built by C. A. Norgren Co., Denver. Featuring new machine tools and materials handling equipment, high-ceiling work areas and 50,000 square feet of floor area, the plant is on a 3½ acre tract in Englewood, a suburb. Company is observing its 25th year in the manufacture of lubrication and air equipment.

Northwest To Get Strip Mill

Seidelhuber Steel Rolling Mill Corp. has been organized in Seattle, Wash., by Frank Seidelhuber Jr., vice-president of Seidelhuber Iron & Bronze Works Inc. Capitalized at $1 million, the new company proposes to build a 12-inch strip mill on a site adjacent to the present water tank fabricating plant.

The mill will be similar to the Steckel type. Plans call for rolling 3000 tons monthly. Coil stock only will be produced first, but later ¼ to ⅜-inch pipe may be fabricated. Also included in the plans are one or two electric furnaces, producing ingots, billets and slabs for finishing.

Moore Tool Expands

The Moore Special Tool Company Inc. of Bridgeport, Conn., is nearing completion of a $250,000 plant expansion program which will increase its facilities by 25 per cent. The construction involves an addition of 15,000 square feet of floor space to the company's main plant, plus $100,000 for new machine tools. Richard F. Moore, president, said full operation will come in February.

Goldsmith Sold to Somech

Somech Industries Inc., New York, bought the nonferrous foundry of C. A. Goldsmith Co., Newark, N. J. Operation will continue under the same corporate title. The company produces both sand and permanent mold aluminum, bronze and copper alloy castings.

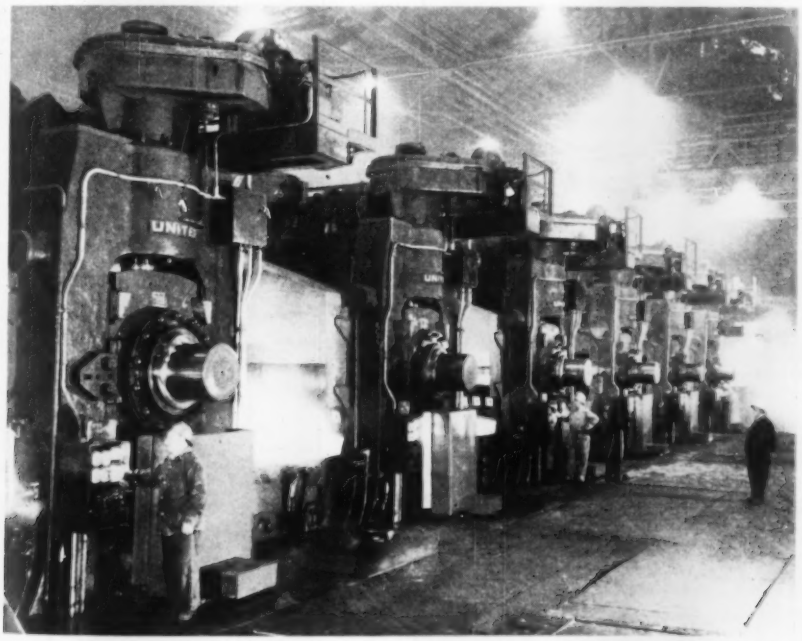
New officers are: W. Page Taggart, Ellis Somech, David R. Ehrlich and L. Goldinger. Mr. Taggart was formerly sales manager of the Goldsmith organization.

Brass Foundry Changes Owners

Newark Brass & Iron Foundry Inc. is the new name of Newark Brass Foundry, Kearney, N. J., recently purchased by Joseph Esposito, owner of Consolidated Pattern Works, North Bergen, N. J. Plant capacity is 7 tons of castings. Willard L. Jacobs, former plant manager of Lincoln Foundry Inc., South Plainfield, N. J., will serve in the same capacity with the new company.

Westinghouse Plastics Plant

Westinghouse Electric Co., Pittsburgh, is scheduling for operations early this year a Micarta plastics plant at Hampton, S. C.



RECORD TIME: Armco Steel Corp.'s strip mill modernization program was completed in 12 days when it installed six heavy stands of mills and rebuilt much of the plant's ancillary facilities. The $3 million project caused no shutdown in any department: Armco had built up a big inventory of hot-rolled sheet coils

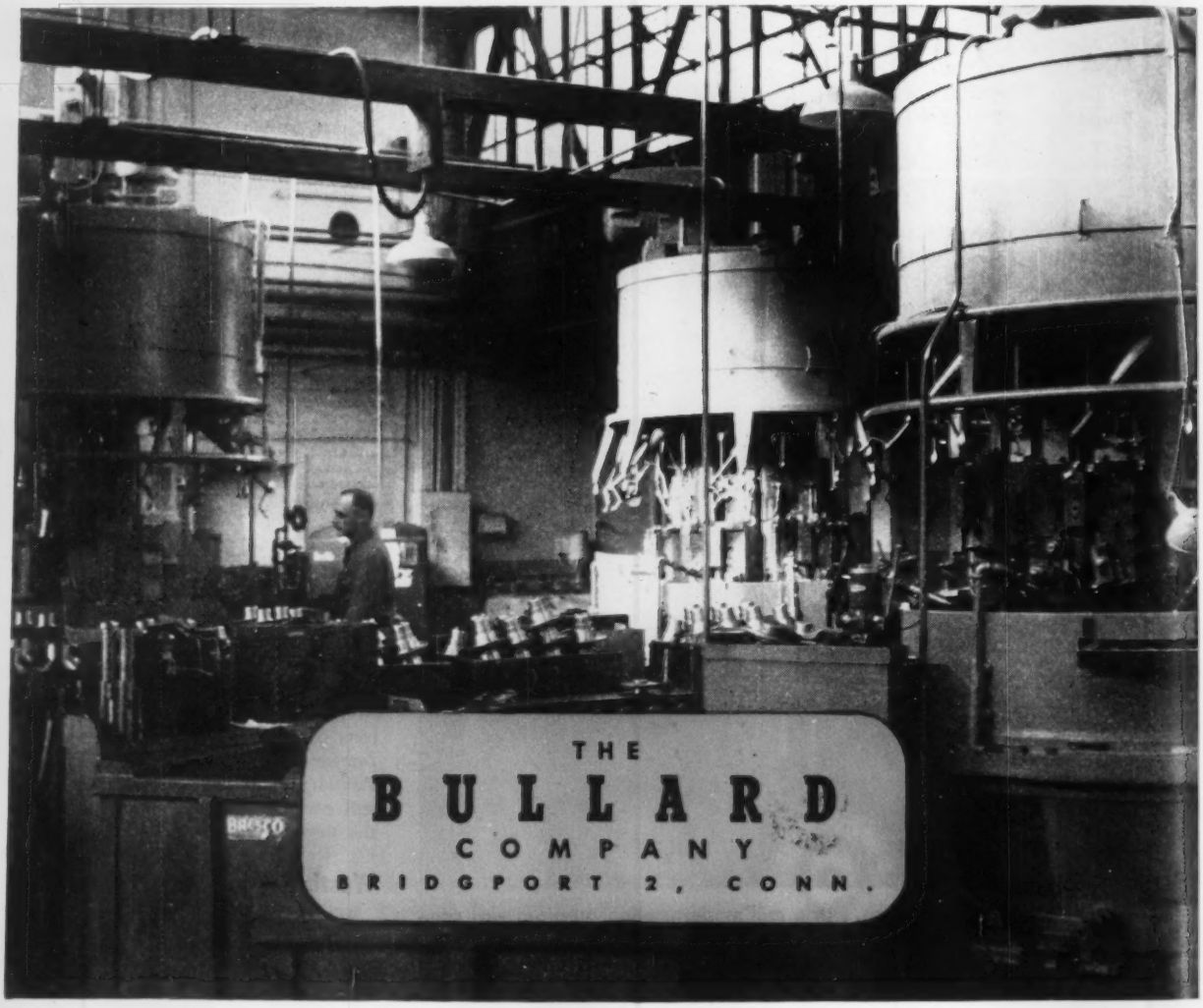
KEEPING PACE WITH TIME . . .

Bullard Mult-Au-Matics

at Spicer Manufacturing Division of Dana Corporation, Toledo, Ohio

Some 30 Mult-Au-Matics — eight spindle type, in 12 and 16 inch sizes, produce a variety of automotive parts. Naturally these machines were installed because of their productive capacity. Since, one Mult-Au-Matic produces the equivalent of three former machines which it replaced. Furthermore, the customer expressed satisfaction with the dependable performance of these machines and remarked on the economies possible with Mult-Au-Matics.

Write BULLARD for Factual Time Savings on your Jobs



By H. C. TUTTLE *Detroit Editor, STEEL*

Mirrors of Motordom

The auto price snarl has caused labor tangles that aren't straightened out yet. A new pricing formula may permit limited increases

DETROIT

CAR PRICES have been a sore spot in many quarters. The auto people had some bitter words to say when the government saw fit to freeze prices of The Big Three's 1951 models at 1950 levels.

The ruckus invaded government offices when economic stabilizer Alan Valentine crossed up some of his associates by demanding a roll-back before hearing the industry's arguments against it. His quick-triggered action, which the president had to back up with tough talk to get compliance, probably had a great deal to do with his resigning the job.

Reverberations — The price freeze continued to have repercussions as late as last week in walkouts and below-the-surface restiveness. Some of those work stoppages were explainable by the nearness of a wage freeze. Others were the result, workers claim, of management speed-ups.

Some tightening of production standards is a natural consequence of the freeze since the only cost-cutting course open to car makers is to reduce their labor bill. Suppliers—several have made the news in the last ten days as victims of sporadic walkouts—are in almost the same position as the automakers. They're governed on the prices they can charge by the automakers' tight-fisted purchasing agents.

More Troubles—As the government price stabilizers worked out the details to permit limited price increases which would restore to all automakers the cost-price relationship that had prevailed in the pre-Korea base period, the number out on strike or idled because of suppliers' strikes in Detroit fluctuated around 20,000. The unauthorized walkout of Briggs Conner plant workers had closed down Packard and Hudson operations. Other labor troubles had previously curtailed Dodge and Nash production.

The price formula, which should clear up much of this trouble by permitting car prices to rise where necessary to offset lower production schedules and higher materials costs in part, was drafted by John M. Hancock, ESA special consultant. This formula contains sliding-scale features to make its function largely automatic. As the metals orders out of Washington permit less and less to be available for civilian consumption that provision will come into full play.

Fight Continues — Resurgence of car demand has almost quashed individual dealers' objections to the tight credit controls embodied in regulation W. But the National Automobile Dealers Association has not forgotten and is making sure that the Federal Reserve Board has them in mind. NADA's point is that the stringent terms of the regulation bring about more inflation, rather than less by forcing buyers to withdraw savings, cash in war bonds and mortgage their houses to raise the money for new car down payments and shell out the cash for the monthly payments.

"From a Practical Standpoint," NADA's past president, Fred L. Haller, told the FRB, "it does not seem economically healthy to compel people to use up savings to make major purchases which normally are made from current income."

DeSoto Makes Its Bow

With introduction last week of the 1951 DeSoto, only two makes are yet to be brought into this year's line-up—the Chrysler and the Oldsmobile.

The new DeSoto is featured, like its sister Chrysler-built cars, by a completely new front end which snuggles the hood between the fenders, tapers the nose down to the newly designed grille and in general eliminates the severely rounded lines which characterized previous design.

Some of the changes obscure the heavy expenditures necessary for their tooling. One of these is the new front fender line which extends further into the front door panel. Another which required new top dies is the widening of the windshield by narrowing the corner posts and expanding the glass area of the rear window by 89 square inches.

Total expenditure by Chrysler Corp. for the tooling and make-ready for the company's new models was about $50 million. The figure doesn't include the cost of engineering the new Chrysler engine.

The new DeSoto grille consists of nine wide curved vertical bars which match the shape of the bumper guards and are individually replaceable in case of damage. Parking lights are adjacent to the outermost grille members and are suspended in the radiator air intake, being a continuation of the fender chrome molding strip which duplicates the wrap-around lines of the bumper and stops short of the front wheel fender opening.

In redesigning the hood, grille opening and front fenders, DeSoto engineers accomplished the effect which chrome trim did in last year's model.

SWEEPING CHANGES: The 1951 DeSoto, on display by DeSoto-Plymouth dealers last Saturday, presents complete changes in exterior and interior styling. Included in the changes are increased power from a larger engine and more riding comfort and convenience

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The grille opening which formerly was outlined with chrome this year is set off by rolling the metal forward, then under and continuing this offset line almost back to the front door.

Improved engine starting and smoother operation during warm-up are claimed for a new automatic choke. In addition the ignition system is waterproofed.

A more powerful engine having a displacement of 251 cubic inches and horsepower of 116 contrasts with the 237-cubic inch and 112-horsepower power plant found in last year's *model*.

Needlepoint Seat Covers Next?

Buick, maintaining the General Motors flair for novelty treatment of special show cars, last week sent women sweeping off to Macy's Art Needlework Department in search of needlepoint seatcovers. A 1951 Riviera Roadmaster was unveiled in that store with the upholstery of the rear section done in custom-designed needlepoint. To match these luxurious panels on rear seat, doors and back of the front seat the rest of the car is trimmed in Vienna Rose and Dove Grey. All instrument moldings and interior knobs and handles are gold plated.

Ivan L. Wiles, Buick general manager, makes a vain plea against the swarms of people who will want to buy this car, saying Buick has no intention of providing needlepoint upholstery in its line and that the car is simply for show purposes.

The Niceties Disappear

To those who must be satisfied with the trim and appointments of today's production-line cars, several manufacturers are now starting to hint that even those niceties may disappear abruptly.

In small type on recent ads these words are now appearing . . . "standard trim and accessories subject to change without notice." These supplement the little legends which read "optional at extra cost" and have to do with white-wall tires, automatic transmission and the like.

With chrome trim the most vulnerable item, and interior chrome plated appointments the likeliest to disappear first, the stylists have come up with acceptable substitutes. In many cases those will be substantially less costly to manufacture than today's fittings. In their experimentations, they have found that graphite-impregnated plastic can be satisfactorily plated, but this is, of course, a substitute which can't be made because of nickel shortages.

Other substitute materials are as hard to get, or harder, than the original, but some of the developments, particularly in the direction of atomized deposition of metals on interior recesses of plastics, may soon appear in profusion. One application will be on the bezel ring surrounding headlights. Vaporized aluminum inside plastic will have the brilliant appearance of chrome but will be impervious to weathering or peeling. From the standpoint of material consumption, amount of aluminum required is negligible.

Chrysler Engine Powerful

Details of Chrysler's 180-horsepower engine are filtering out of that company's engineering laboratories. There seems to be some question in everyone's mind whether that much "soup" is of any value in a passenger car. Chrysler people say that much power will find acceptance for the acceleration, hill climbing ability and flexibility which it offers.

The company apparently has no definite future plans for putting the engine in more than a limited number of cars. The first tooling setup is for production of approximately 25 of the new engines an hour. Considerably more public reaction and experience with the design is desired before any major moves in the direction of broader penetration are made with it. Its first use will be in New Yorker and Imperial models.

Auto, Truck Output

U. S. and Canada

	1950	1949
January	609,882	445,092
February	505,593	443,734
March	610,678	543,711
April	585,705	569,728
May	732,161	508,101
June	897,856	623,689
July	746,771	604,351
August	842,304	678,092
September	760,808	657,073
October	795,918	601,021
November	632,943	475,454
December	659,222	384,318

Weekly Estimates

Week Ended	1950	1949
Dec. 30	135,229	113,026
	1951	1950
Jan. 6	99,955	116,768
Jan. 13	139,679	154,552
Jan. 20	158,907	158,432
Jan. 27	152,000	141,036

Estimates by Ward's Automotive Reports

* Preliminary.

One feature of the engine which seems especially geared to the times is its operation on regular gas. In fact use of premium gas with this engine provides less of an improvement in performance than can be expected from a more conventional engine. However, Chrysler engineers say its acceptance of octane numbers is wider than that of any engine they know.

Washington Offices Opened

To strengthen their liaison with government procurement plans two automakers recently established Washington offices. Hudson Motor Car Co., which has affirmed its willingness to get into defense work but has not yet been mentioned as having landed any of the now numerous orders which are out in the industry, put John J. Murphy in charge of this hot spot. Formerly international representative for Avco Mfg. Corp., Mr. Murphy was commanding officer of a heavy ordnance company and an Army liaison officer in World War II.

Ford Motor Co. has set up Gerald J. Lynch as director of its defense mobilization office in Washington. Formerly assistant director of the company's office of defense products under Richard E. Krafve whose headquarters are in Dearborn, Mr. Lynch will co-ordinate his activities with those of Ford's ODP. He directed much of Ford's war contract renegotiations before being appointed executive assistant to the controller.

Ford Expands at Cincinnati

Ford has decided to expand its new automatic transmission division at Cincinnati, adding about 220,000 square feet or nearly as much as the original plant contains. This additional space will be used to house the manufacture of engine lubrication pumps for P & W aircraft engines. These pumps will go to the aircraft engine division plant in Chicago for assembly in B-36 engines.

Role of the former Dodge-Chicago-Tucker plant is more and more being viewed as an assembly operation, sources close to Ford disclose, and a major part of the components required in these engines will be farmed out. Best guess is that approximately 15 months will be required before this mammoth facility gets into production.

The Cincinnati supplying plant, however, is expected to begin operations this fall, with about 1000 additional workers needed. Automatic transmission production will not be affected.

The Business Trend

Momentum from defense program, beginning to show up in production indexes, helps push industrial activity to within a few points of postwar record level

THE gathering force of the defense program is beginning to register in industrial activity indexes.

Each week new output records are being established by the steel industry. Electric power production is not far from setting a new alltime high record. Dollar volume of contracts awarded for privately financed industrial buildings reached a new high.

Effect of these and other buoyant factors is a continuing rise in STEEL's industrial production index. After climbing 5 points in the week ended Jan. 20 and reaching 217 per cent of the 1936-39 average, the index was only 5 points below the postwar high recorded in the last two weeks of last October. Much of the climb in the last two weeks has been a recovery from the customary yearend slackening in industrial activity, but much of the snappiness characterizing the rebound stems from pressure from the mobilization program.

Civilian production still constitutes the bulk of industrial activity but this is due to shrink as government controls on materials take effect. Whether defense production can take up the slack without delay remains to be seen.

Another Record for Steel . . .

Newest record for production of steel for ingots and castings was scheduled for the week ended Jan. 27, when output of slightly more than 2 million net tons was expected. The preceding week had been a record-breaker too. Output then was 1,991,000 net tons. To attain these tonnages, the industry is operating at approximately 100 per cent of capacity, which too is at an alltime high level. Further expansion of capacity is underway.

Industrial Building Booms . . .

Boosting of the steel industry's capacity, along with other industrial expansion stemming from the nation's mobilization program, pushed the awarding of privately financed contracts for industrial building to an unprecedented $141.4 million in the week ended Jan. 18, reports *Engineering News-Record*. Contracts for public buildings were high, too, at $107.4 million, but far from a record. Adding in other construction, the heavy construction awards for the week totaled $391.6 million.

Through the first 18 days of January, engineering construction awards of all classes totaled $961.6 million, 38 per cent above the $669.1 million for the corresponding period of last year.

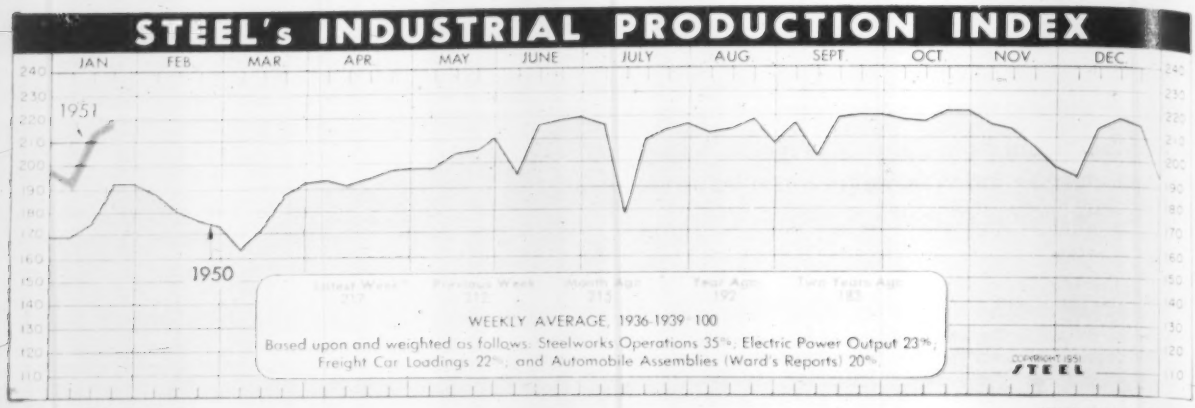
Automobile Output Rises . . .

Automobile output continued in the week ended Jan. 20 to gain ground from the letdown of the yearend and model changeover. That week's crop of passenger cars and trucks in the United States and Canada was 158,907. That was the highest since the week ended Dec. 23.

The volume will increase if auto producers can be spared from effects of labor trouble that has been hampering parts suppliers. Output, nevertheless, is approximately in line

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	99.5	99.0	101.5	93.0
	Electric Power Distributed (million kilowatt hours)	6,909	6,981	7,033	6,041
	Bituminous Coal Production (daily av.—1000 tons)	1,977	1,677	2,001	1,237
	Petroleum Production (daily av.—1000 bbl)	6,051	5,762	5,763	4,962
	Construction Volume (ENR—Unit $1,000,000)	$391.6	$415.8	$692.0	$182.2
	Automobile and Truck Output (Ward's—number units)	158,907	139,679	160,912	158,432
	*Dates on request. †Weekly capacities, net tons: 1951, 1,999,035; 1st half 1950, 1,906,268; 2nd half 1950, 1,928,721.				
TRADE	Freight Car Loadings (unit—1000 cars)	785†	783	747	619
	Business Failures (Dun & Bradstreet, number)	167	193	174	231
	Money in Circulation (in millions of dollars)‡	$27,200	$27,415	$27,929	$27,121
	Department Store Sales (changes from like wk. a yr. ago.)‡	+31%	+39%	+9%	−5%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$16,934	$17,198	$18,247	$14,406
	Federal Gross Debt (billions)	$256.0	$256.0	$256.7	$257.0
	Bond Volume, NYSE (millions)	$30.9	$27.2	$32.6	$23.6
	Stocks Sales, NYSE (thousands of shares)	18,248	17,362	17,372	7,980
	Loans and Investments (billions)†	$70.8	$71.2	$70.3	$67.4
	United States Gov't. Obligations Held (millions)†	$33,046	$33,294	$33,439	$37,920
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	171.92	171.92	167.89	156.13
	STEEL's Nonferrous Metal Price Index‡	258.5	255.8	246.9	160.5
	All Commodities†	178.7	178.1	174.7	151.4
	Metals and Metal Products†	188.3	187.9	184.3	168.6
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100. ††1935-1939=100.				



Week Ended Jan. 29

with that of a year ago. In the week ended Jan. 21, 1950, production was 158,432 passenger cars and trucks.

New High Again for Prices . . .

The fast pace of business activity, along with an expanding program of mobilization, continues to give the inflationary punch to prices, with a result there's another new alltime high in the all-commodities price index of the U. S. Bureau of Labor Statistics. That new record, set in the week ended Jan. 16, puts the index at 178.7 per cent of the 1926 average. Previous record was 178.1 in the preceding week.

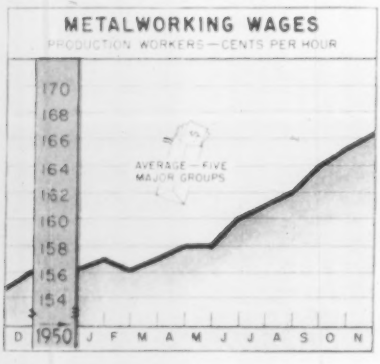
The index now is 2.3 per cent above four weeks ago, 13.9 per cent above the May 24-June 24 average, and 18 per cent above one year ago. Farm products and foods declined fractionally, fuel showed no change; all other groups advanced.

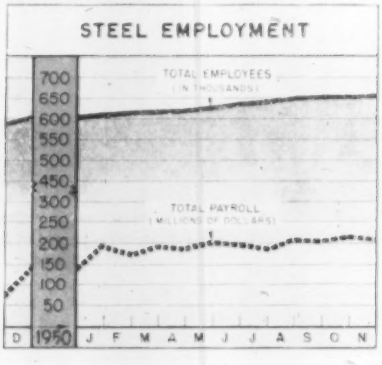
Coal Output Up . . .

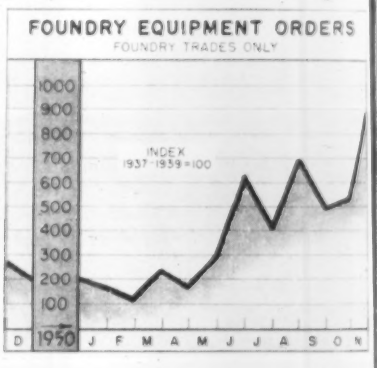
To provide fuel needed for the heavy volume of industrial activity, the bituminous coal producers upped their output in the week ended Jan. 13 to 11,860,000 net tons. That was the highest level since the week ended Dec. 16. In the week ended Jan. 6, production was 10,060,000 tons.

On a Buying Spree . . .

Putting a demand on the country's plants is the heavy buying by consumers. In the first half of January consumer spending rose noticeably from the low point reached in the week immediately after Christmas. Retail stores continued to sell much more than in the similar period a year earlier, Dun & Bradstreet Inc. reports. Merchants in many parts of the nation reported a resurgence







Metalworking Hourly Wages
(cents)

	Production Workers—Five Major Groups				
	Prim.	Fab.	Mach-	Elec.	Trans.
1949	Mtls.	Prod.	inery	Mchy.	Equip.
Nov.	158.0	145.1	153.8	143.5	166.2
Dec.	159.7	147.2	154.3	144.6	168.4
1950					
Jan.	161.5	148.7	154.7	144.3	168.2
Feb.	160.3	148.1	155.2	144.2	167.7
Mar.	160.4	148.0	156.0	144.3	167.8
Apr.	160.9	148.8	156.9	144.6	170.6
May	161.9	149.6	157.6	145.3	169.8
June	163.0	151.5	158.3	145.1	172.7
July	164.5	152.2	159.5	146.4	172.8
Aug.	163.9	153.9	160.7	146.7	173.5
Sept.	167.2	156.4	162.9	148.5	177.0
Oct.	166.8	157.9	165.6	152.2	177.9
Nov.	167.9	158.7	167.5	153.6	177.9

U. S. Bureau of Labor Statistics

Steel Employment, Payrolls

	Employees† in Thousands		Payrolls in Millions	
	1950	1949	1950	1949
Jan.	609	650	$189.3	$202.1
Feb.	613	653	174.7	189.8
Mar.	616	652	190.0	207.2
Apr.	621	647	186.2	191.9
May	628	637	199.9	188.4
June	636	625	195.3	181.8
July	643	610	188.7	160.3
Aug.	649	603	206.6	173.6
Sept.	650	600	203.8	173.5
*Oct.	650	584	212.2	63.1
*Nov.	653	584	208.0	63.1
Dec.	602		....	136.9

† Monthly average. * Averages taken from single figure for the two strike affected months in 1949. American Iron & Steel Institute.

Foundry Equipment Orders

	Index		Value in Thousands	
	1950	1949	1950	1949
Jan.	159.3	149.9	$731	$694
Feb.	113.1	144.4	519	668
Mar.	225.2	190.8	1,034	883
Apr.	160.6	172.0	737	797
May	294.9	121.9	1,353	565
June	622.7	164.9	2,858	764
July	401.8	146.6	1,844	679
Aug.	693.6	127.1	3,183	589
Sept.	483.8	166.6	2,220	772
Oct.	526.8	133.5	2,417	618
Nov.	885.5	270.4	4,077	1,256
Dec.	....	201.0	....	929

Foundry Equipment Mfrs. Assoc.

Charts—Copyright 1951, STEEL

of what appeared to be "scare-buying." Many shoppers were apparently anticipating their needs in the face of possible shortages and higher prices. Unlike the wave of anticipatory buying immediately after the start of the Korean war, the current one was not largely limited to durable goods.

More New Locomotives . . .

If you thought you saw more new diesel locomotives last year than ever before, you're right.

Class 1 railroads in 1950 installed more new locomotives in service than in any one of the last 27 years, and nearly all of them were diesel. New locomotives put in service in 1950, says the Association of American Railroads, totaled 2396, of which 2372 were diesel, 12 were steam and 12 were electric. Locomotives installed in 1949 totaled 1865, of which 1808 were diesel and 57 were steam.

Of the total number put into service in 1950, the 264 installed in December were the largest number recorded in any month in the last 27 years.

On Jan. 1, 1951, Class 1 railroads had on order 1644 new locomotives, the largest number awaiting delivery at any time since 1923, with the exception of Dec. 1, 1950, when that number was exceeded by 13. Of the total number on order at the beginning of this year 1624 were diesel, 16 steam and 4 electric.

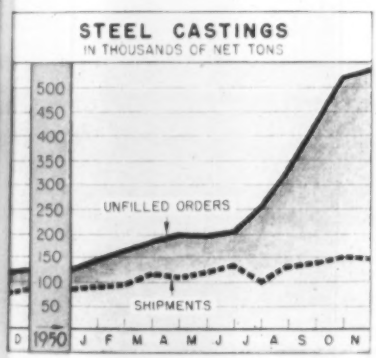
Cleaner Sweep . . .

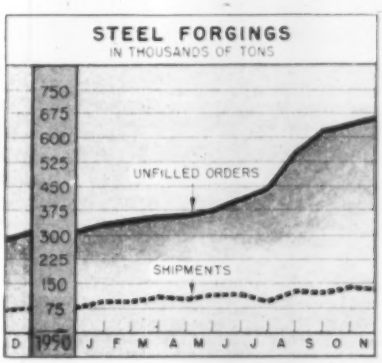
The fast pace of vacuum cleaner manufacturers in 1950 put their total output 22.3 per cent over that of 1949, the Vacuum Cleaner Manufacturers' Association reveals. Factory sales of standard-size household vacuum cleaners totaled 3,529,412 units in 1950, compared wtih 2,886,514 in 1949.

Sales in December totaled 288,756 units, an 8.8 per cent increase over the 265,310 in November, and also an 8.8 per cent increase over the 265,513 vacuum cleaners in December, 1949.

Issue Dates of Other FACTS and FIGURES Published by STEEL:

Construction	Dec.25	Indus. Produc.	Jan.15	Radio, TV	Aug.14
Durable Goods	Nov.27	Ironers	Jan.15	Ranges, Elec.	Dec.4
Fab. Structural Steel	Jan.8	Machine Tools	Jan.22	Ranges, Gas	Dec.4
Freight Cars	Jan.22	Malleable Cast.	Dec.18	Refrigerators	Jan.15
Furnaces, Indus.	Jan.22	Metalwkg. Employ.	Jan.8	Steel Shipments	Dec.25
Furnaces, W. Air	Jan.22	Price Indexes	Jan.22	Vacuum Cleaners	Jan.15
Gear Sales	Jan.8	Pumps, New Orders	Jan.8	Washers	Jan.15
Gray Iron Castings	Jan.8	Purchasing Power	Dec.11	Water Heaters	Dec.25





Steel Castings

Thousands of Net Tons

	Shipments		Unfilled Orders*	
	1950	1949	1950	1949
Jan.	88.8	140.6	142.5	338.9
Feb.	91.8	135.0	165.2	320.2
Mar.	111.8	138.9	185.6	284.8
Apr.	107.0	120.0	201.6	250.5
May	117.9	106.2	198.0	191.5
June	131.1	116.1	206.8	173.2
July	98.3	78.7	255.4	155.5
Aug.	128.4	90.0	329.9	143.6
Sept.	134.6	86.5	428.0	127.7
Oct.	149.6	70.7	521.8	124.8
Nov.	145.9	76.4	537.7	117.9
Dec.	....	84.5	....	122.9

* For sale. U. S. Bureau of the Census.

Steel Forgings

Thousands of Net Tons

	Shipments		Unfilled Orders*	
	1950	1949	1950	1949
Jan.	93	124	327	571
Feb.	93	111	341	540
Mar.	109	120	350	503
Apr.	99	104	357	465
May	114	92	373	412
June	117	101	408	377
July	95	70	446	348
Aug.	124	97	548	312
Sept.	122	88	620	294
Oct.	137	81	643	280
Nov.	130	73	657	287
Dec.	...	78	...	308

* For sale. U. S. Bureau of the Census.

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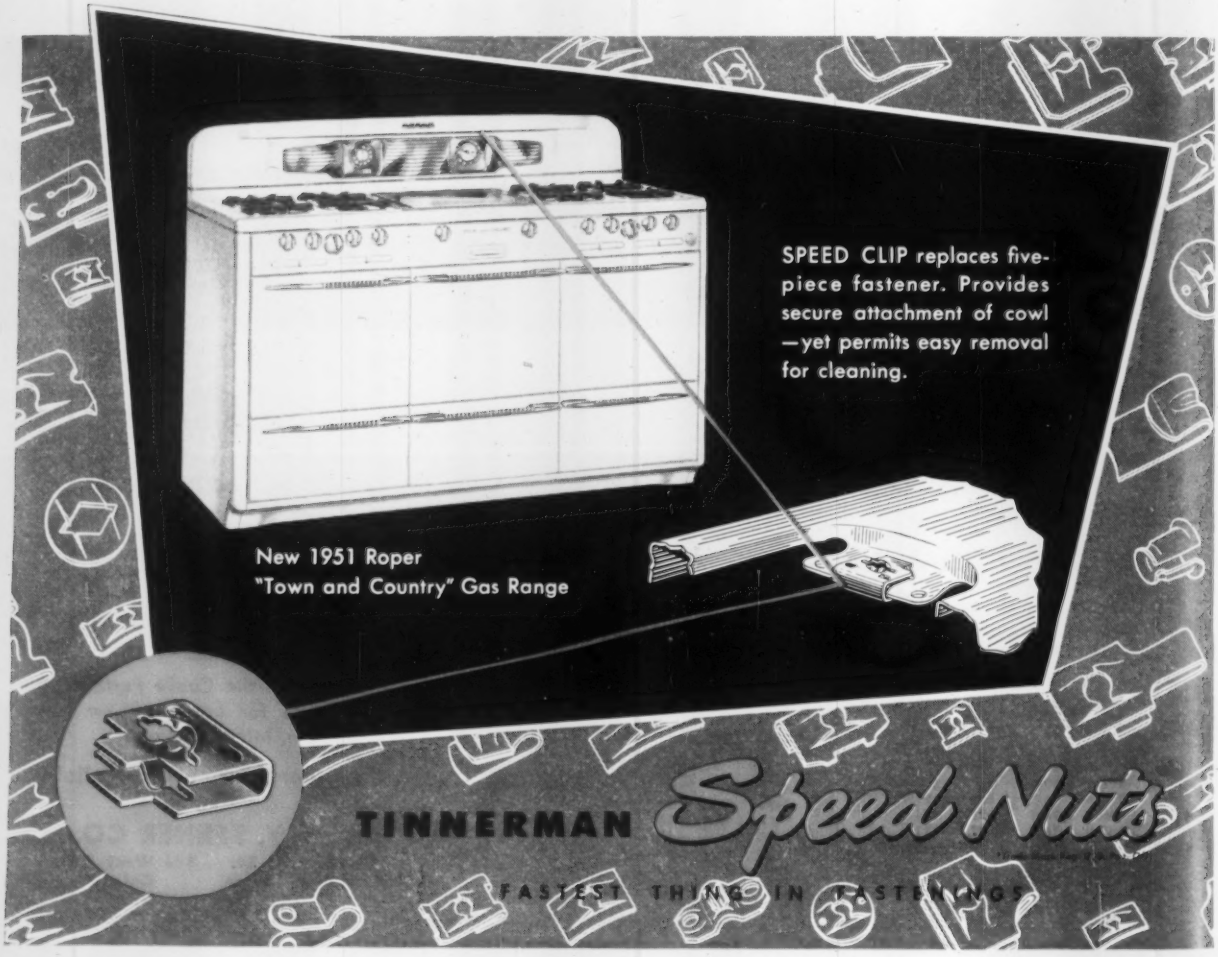
SPEED CLIPS* help ROPER "boil down" assembly costs

● "Until recently each vent grill cowl on our ranges was attached with a five-piece fastener," reports the Geo. D. Roper Corporation, Rockford, Illinois.

"Now we are making the same attachment with a *single* SPEED CLIP! As with all 65 of the Tinnerman fasteners used on each of our ranges, the assembly savings on this new application are substantial."

Everywhere you look today you find new proof of SPEED NUT savings power. If you haven't made a recent check of your products, we will be glad to conduct a thorough Fastening Analysis. Ask your Tinnerman representative for details on this service, and write for your copy of SPEED NUT Savings Stories. TINNERMAN PRODUCTS, INC., Box 6688, Department 12, Cleveland 1, Ohio. In Canada: Dominion Fasteners Limited, Hamilton. In Great Britain: Simmonds Aerocessories, Limited, Treforest, Wales.


SPEED CLIP replaces five-piece fastener. Provides secure attachment of cowl—yet permits easy removal for cleaning.
New 1951 Roper
"Town and Country" Gas Range
TINNERMAN Speed Nuts
FASTEST THING IN FASTENINGS

Men of Industry

DAVID WHITE
. . . new president, Lester Engineering

C. H. WILLS
. . . directs sales, Michigan Abrasive

ROBERT C. TYSON
. . . V. P.-comptroller, U. S. Steel

David White was elected president, **Lester Engineering Co.**, Cleveland. **David Sloane** becomes vice president in charge of engineering development. **William Schwartz** continues as chief engineer.

Anaconda Wire & Cable Co., New York, appointed **Maurice J. McCarthy Jr.** manager, magnet wire sales, with headquarters at Muskegon, Mich. He is assisted by **Alfred Koch. Richard B. Steinmetz** was appointed general manager of mills, with headquarters at Hastings-on-Hudson, N. Y.

Edgcomb Steel Co., Philadelphia, appointed **Peter B. Kline** manager of stainless sales. He was with the Rustless Division, Armco Steel Corp.

James H. Judge was appointed sales manager, gasoline, oil and industrial meter line, **Rockwell Mfg. Co.**, Pittsburgh.

Elected vice presidents of **Oliver Corp.**, Chicago, are: **Homer F. Donagher,** in charge of exports; **W. E. Miles,** vice president in charge of crawler tractor and industrial sales; and **L. Pierce Richie,** vice president and director of purchases.

Pacific Airmotive Corp., Burbank, Calif., appointed **Col. Luke Harris** as general production manager of the Burbank engine and aircraft divisions, and Chino-Ontario aircraft division. **Neal J. Coleman** was made assistant general manager, Pacific Airmotive Airport Division. **William Laughlin,** a member of PAC's sales staff, becomes acting sales manager. **Ford T. Palmer** is military co-ordinator of PAC's three divisions.

C. H. Wills was promoted from general sales manager to director of sales, **Michigan Abrasive Co.**, Detroit. In his former position he is succeeded by **B. S. Meade,** who was vice president, American Swiss File & Tool Co., Elizabeth, N. J.

John H. Elliott was appointed general manager of manufacturing, and **William C. Oberg,** manufacturing consultant, **United States Steel Co.**, Pittsburgh. **Charles W. Baldwin** was appointed director and **John W. Clinton,** assistant director of the coal chemical sales division, commercial department. Mr. Baldwin replaces **J. V. Freeman,** retired.

R. Lindley Murray was elected president and **Edwin R. Bartlett,** chairman of the board of **Hooker Electrochemical Co.**, Niagara Falls, N. Y. Mr. Bartlett was president since 1945.

John A. Petroskas was appointed chief metallurgist, **Midvale Co.**, Philadelphia.

Gilbert Soler has resigned as vice president, manufacturing operations, and director of **Atlas Steels Ltd.**, Welland, Ont., Canada, which he joined in 1946.

Pittsburgh Testing Laboratory, Pittsburgh, elected **A. R. Ellis** chairman of the board, **C. M. Houck,** president, and **R. C. Emmett,** vice president.

George A. Seaver was appointed manager, New York city branch, and **William H. Leland,** manager, Newark, N. J., branch, **Howe Scale Co.**, Rutland, Vt.

Robert C. Tyson, in addition to his post as comptroller, was elected a vice president, **United States Steel Corp.**, New York.

C. Russell Conklin, eastern district manager, Republic Rubber Division of **Lee Rubber & Tire Corp.**, Youngstown, takes over management of Republic's Philadelphia office. **Warren Ingersoll,** formerly in charge, is now assistant to the president of the Lee corporation, and will be located at Conshohocken, Pa. **Ray L. Beveridge** was appointed field engineer at Philadelphia for Republic.

W. A. Cook was appointed general manager of sales, iron and steel division, **Barium Steel Corp.**, Harrisburg, Pa., to succeed **F. L. Steuber,** resigned. Mr. Cook continues as general manager of sales, Phoenix Iron & Steel Co., an affiliated company.

Claude Kershner, formerly with Phoenix Iron & Steel Co., was appointed purchasing agent, **Birdsboro Steel Foundry & Machine Co.**, Birdsboro, Pa.

Robert Pollock was appointed district sales manager, New York district, wire rope divisions, **American Chain & Cable Co. Inc.**, Bridgeport, Conn. He succeeds **Walter E. Moore,** who retires Jan. 31.

Ben Kaul was appointed to the new position of technical development engineer, **Mullins Mfg. Corp.**, Salem and Warren, O. **Michael Theil** was promoted to superintendent of tools and dies; **Ralph Bradley** becomes general superintendent of engineering, tool design and estimating at both

plants; and **Andrew W. Arnold** becomes superintendent, Warren plant tool department.

Caloric Stove Corp., Philadelphia, elected **Julius Klein** president to succeed **Nathan R. Klein,** now chairman of the board. Mr. Klein continues as sales director. **Meyer Klein** was elected vice president.

Dr. John Russell, technical director, was elected vice president in charge of production, **National Glaco Chemical Co.,** a subsidiary of Ekco Products Co., Chicago.

Theodore Buit was advanced from service to sales engineer for the western Michigan territory of **Pemco Corp.,** Baltimore.

Edward L. Martin has resigned as technical director, Janney Cylinder Co., to become vice president in charge of technical development for **Charles J. Haas Inc.,** Philadelphia.

Frederick W. von Raab was made manager of warehouse distribution, **Carpenter Steel Co.,** Reading, Pa.

Robert C. Kuhn was appointed assistant district manager, Cleveland sales office, **Crucible Steel Co. of America.**

Victor F. Stine and **Lloyd L. Stouffer** were elected directors of **Pangborn Corp.,** Hagerstown, Md. Mr. Stine also assumes duties of vice president in charge of sales and engineering, while Mr. Stouffer becomes secretary and treasurer and will be in charge of production. **P. J. Potter** is retiring from active duties but continues as a director and vice president, acting in a consulting capacity and overseeing special assignments.

HAROLD G. INGERSOLL
. . . Borg-Warner vice president

L. G. PORTER
. . . Borg-Warner treasurer

Borg-Warner Corp., Chicago, elected **Harold G. Ingersoll** a vice president. He retains the presidency of the Ingersoll Steel Division at New Castle, Ind. **L. G. Porter** was elected treasurer of the corporation. He was vice president and secretary, Calumet Steel and Franklin Steel Divisions. He succeeds **Mathew Keck,** now a vice president.

John R. Gephart, for 16 years associated with the sales department of Harrisburg Steel Corp., has opened his own business as a sales representative with offices at 100 Park Ave., New York.

Michael M. Carmody was appointed central sales manager, liquid plastics division, **Ferro Enamel Corp.,** Cleveland.

Blaw-Knox Co., Pittsburgh, announces personnel changes in its Lewis Foundry & Machine Division: **W. B. Hackett** was appointed assistant to the president, in charge of engineering. **Clyde W. Baker** was appointed manager of contract engineering. **A. C. Fisher** becomes manager, sales engineering and service. **George T. Andrews** was appointed manager, machinery sales. **John P. Solomon,** works manager, Union Steel Castings Division, retired after completion of 35 years of service with the division.

L. A. Keeler, vice president, director and comptroller, **Fairbanks, Morse & Co.,** Chicago, retired at the end of 1950 after 39 years of service with the company.

Gordon F. Friauf was appointed general material supervisor, **Allis-Chalmers Mfg. Co.,** Milwaukee, to succeed **C. A. McCormack,** retired. New representatives named to the company's general machinery division district offices are **Thomas C. Smith,** Milwaukee; **E. E. Strickland Jr.,** New York; and **Elwood C. Gerber,** Pittsburgh.

Roy F. Hancock was appointed assistant to the vice president-sales, **Vanadium Corp. of America,** New York. He was manager, eastern alloy steel sales, Carnegie-Illinois Steel Corp.

Charles H. Wagner was elected a vice president and director, **Geroter May Corp.,** Baltimore.

Edwin E. McConnell, controller, Norton Co., Worcester, Mass., and **Lewis S. Greenleaf Jr.,** formerly vice president-sales, Durex Corp. and Durex Abrasives Corp., were elected members of **Norton Co.'s** board of directors. **Thomas S. Green,** a director for 13 years, retired from the board.

Willis J. Keenan was appointed general manager, Woodhouse Chain Works, Trenton, N. J., division, **Round Associate Chain Cos. Richard R. Tet-**

VICTOR F. STINE
. . . V. P.-sales & engineering, Pangborn

LLOYD L. STOUFFER
. . . sec'y-treas. & production, Pangborn

STEVE GIRARD
. . . asst. gen. mgr., Kaiser-Frazer

JAMES S. McCULLOUGH
. . . joins Lamson as sales promotion mgr.

EDWARD O. BOSHELL
. . . heads Westinghouse Air Brake and sub.

telbach was named advertising manager, Round Associate Chain Cos., Cleveland.

Steve **Girard** was appointed assistant general manager, **Kaiser-Frazer Corp.**, Willow Run, Mich. Associated with various Henry J. Kaiser interests since 1938, he became general sales manager of K-F a year ago. In his new position Mr. Girard will work with **John Hallett,** vice president and general manager, in organizing the company's activities for manufacture of the C-119 Fairchild cargo airplane for U. S. Army Air Force and continued production of automobiles.

J. W. Bryant was named controller, **Reserve Mining Co.,** jointly owned by Armco Steel Corp. and Republic Steel Corp., and whose properties are managed by Oglebay-Norton & Co., Cleveland.

W. A. Finn was named general European manager, **Worthington Pump & Machinery Corp.,** Harrison, N. J., to replace **A. W. Fraser,** who has assumed an executive sales position with Worthington in Chicago, and will make his headquarters there in February.

James S. McCullough, since 1939 director of advertising and sales promotion, Philadelphia division, Yale & Towne Mfg. Co., was appointed sales promotion manager for **Lamson Corp.,** Syracuse, N. Y., the first firm he served in an industrial marketing capacity, and which he joined after graduation from Syracuse University in 1927. He became its advertising manager in 1932.

Stanley Electric Tools, division of Stanley Works, New Britain, Conn., appointed **Paul R. Briggs** as district sales manager for metropolitan New York, New Jersey, Pennsylvania with the exception of Pittsburgh, District of Columbia, Delaware, Maryland, Virginia and West Virginia.

Richard E. Coe was elected assistant to the president of **Electric Furnace Co.,** Salem, O.

Leslie D. Calhoun was appointed manager, **Sterling Engine Co.** plant in Buffalo. He was chief engineer.

Link-Belt Co., Chicago, appointed **Andrew K. Kolar** assistant sales manager, Pershing road plant products, with office in Chicago. **Stuart T. Penick** succeeds Mr. Kolar as district manager, Moline, Ill.

Edward O. Boshell was elected chairman and president, **Westinghouse Air Brake Co.** and its subsidiary, **Union Switch & Signal Co.,** Pittsburgh. **A. N. Williams,** president of both companies since 1946, was elected vice chairman of the boards. **Herbert A. May** is senior vice president.

Marsh Heating Equipment Co., Skokie, Ill., appointed **William Ensign** assistant sales manager.

Norman W. James, general purchasing agent, **Pennsylvania Salt Mfg. Co.,** Philadelphia, has withdrawn from active service but continues as a consultant and adviser on procurement problems.

Carlton H. Rose was named manager of **National Lead Co.'s** Washington office.

Watson N. Haarbauer was appointed assistant district manager at San Francisco for **United States Steel Supply Co.,** subsidiary, U. S. Steel Corp.

LeVern Crossen is the new management representative at the Seattle plant of **Bethlehem Pacific Steel Corp.**

Fred S. Hage Jr. was appointed head of **Solar Aircraft Co.'s** Dayton, O., office.

OBITUARIES...

Archibald D. Field, 66, vice president and treasurer, **W. H. Muller & Co. Inc.,** New York, until retirement two years ago, died Jan. 19.

Moses H. Moss, 62, for 40 years in the steel business in Cleveland, died Jan. 22. Mr. Moss was associated with Freedman Bros. Co., later merged with **Reliance Steel Co.,** which in turn became a division of Detroit Steel Corp.

W. K. Richardson, 59, recently retired as purchasing agent, **Otis Elevator Co.,** New York, died Jan. 13 at his home in Santa Monica, Calif.

Albert D. Wilson, 73, chairman of the board and former president, **Bristol Brass Corp.,** Bristol, Conn., died Jan. 18.

Alvin L. Guilford, 82, sales manager, Chicago office, **Ajax Mfg. Co.,** for 42 years before his retirement in 1943, died Jan. 16.

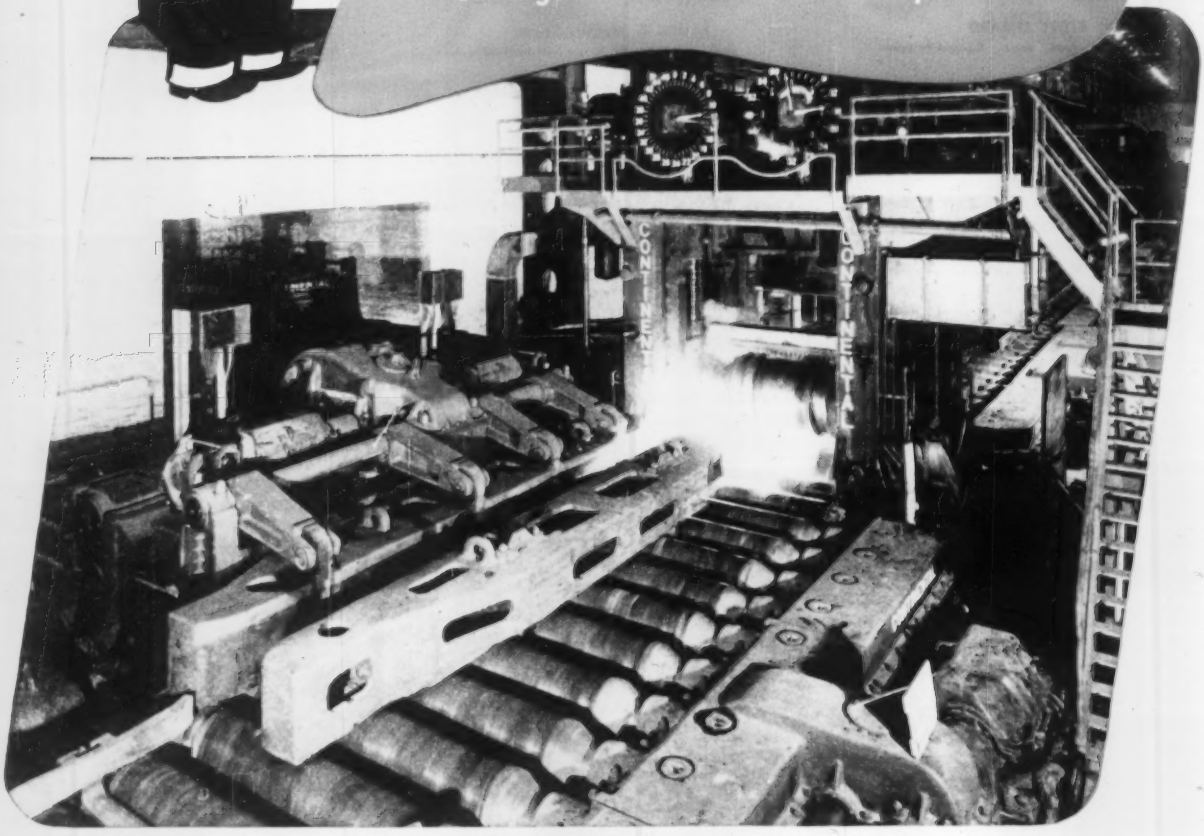
Moritz Bierling, 74, a sales engineer with **Heli-Coil Corp.,** Long Island City, N. Y., died Jan. 16.

Nathaniel G. Symonds, 72, a former vice president, **Westinghouse Electric Corp.,** Pittsburgh, died of a heart attack Jan. 20. He retired in 1941.

John F. Hennessy, 65, manager of sales, Chicago district, **Bethlehem Steel Co.,** for the last 22 years, died Jan. 17 after a brief illness.

"Look What The Superintendent of a Leading Steel Company Says! We'll send you his name on request."

"The Trabon System on our old blooming mill gives us 50 more steel tons per week! We credit this increase and savings to the elimination of rejects."



Most of your machinery stoppages—due to bearing failures—could be avoided with Trabon. Shutdowns for lubrication are eliminated... Trabon lubricates as your machines produce!

Let us tell you about the features of Trabon oil and grease systems, and how they can save you thousands of dollars. Call or write today.

Trabon

OIL AND GREASE SYSTEMS

TRABON ENGINEERING CORPORATION
1814 East 40th Street • Cleveland 3, Ohio

Production AND Engineering NEWS AT A GLANCE

MECHANIZATION FOR PLATERS—Full automatic plating equipment, of the straight-line, return or rotary type, is bringing more engineered precision (p. 63) into the electroplating field, with resultant economies springing from more efficient materials handling, easier servicing, better ventilation and solution control. Flexibility of the transfer cycle aids in the reduction of dragout as well as solution contamination.

SEND IN THE SECOND TEAM— Materials specialists are knocking their brains out these days trying to figure substitutions for metals and alloys coming into critically short supply because of government limitation orders. Sharp cuts in nickel have been a problem for over six months, end-use restrictions on copper will make March 1 a bleak day, and a chop on aluminum is not far off. Some manufacturers have been forehanded to the extent they will take cutbacks in stride; others have not. A television builder has worked out a long list of metal substitutions and circuit design changes which, it is hoped, will enable production to keep moving. Copper-clad steel for solid copper, elimination of transformers in favor of selenium rectifiers, compacted iron powder speaker magnets instead of alnico, etc., on down the line.

SSSSHHHHHHHHHHH!—"Classified", "restricted", "secret" and "top secret", plus all the other hocus-pocus censorship terms of World War II, are again infiltrating the Department of Defense insofar as the release of technical information on design, materials specification and production of many military items are concerned. There seems to be recognition of the fact that if industry is to be called upon to participate in broad-scale manufacturing programs, it should be informed about what is to be produced, but the tendency to clamp down censorship restrictions, seemingly just for the hell of it, is already apparent. Thus, a company receives a multimillion dollar contract for hot forging and machining a mess of projectiles, and the army says the activity is "restricted" as to detail. Cold extrusion of projectiles is very hush-hush, despite publication, in STEEL and elsewhere, of voluminous data. Actually, the Germans pioneered cold extrusion of a complete range of steel projectiles early in the last war in the interests of saving material, so the USSR knows all about that deal. Another "shut up" item is a "special type of ammunition which greatly increases the effectiveness of a considerable number of tanks and antitank weapons", for which the army upped its last budget request by $24 million. One newspaper writer speculated that fissionable atomic war heads were involved, this drawing muffled snorts of derision from the Pentagon.

TAKES HEAT PUNISHMENT— Fused stabilized zirconia refractory now available commercially, will withstand temperatures up to 4600 F, and is at once a poor conductor of electricity at low temperatures and an excellent conductor at high heat. It comes (p. 68) from zircon in Australian and Florida beach sands and from baddeleyite in Brazil.

TWO PUMPS IN ONE—Hydraulically operated refueling pump which can do the work of eight electric pumps, and twice as fast, has been perfected by the Air Force's Air Materiel Command in co-operation with Nash Engineering Co. The pump, including its hydraulic motor, weighs only 51 pounds, a saving of approximately 550 pounds for a complete refueling system. The unit consists actually of two pumps built into one assembly. Since fuel boils at the rarefied atmosphere of high altitudes one pump handles only the vapor emanating from the fuel, keeping the main pump clear for liquid gasoline and thereby ruling out dangers of vapor lock. Design is simple, a hydraulic driving motor being mounted in the gasoline tank and bolted onto the pump driveshaft, the entire unit measuring 10 inches high, 18 inches long and 12 inches wide.

CLEAN COAL CUTS COSTS—Cut the ash content of metallurgical coal 1 per cent and you knock 30 cents a ton off pig iron costs. Inland Steel's new coal preparation plant in Kentucky will reduce ash by as much as 7 per cent, resulting in 10 per cent lower slag volume in the blast furnace, 4 per cent decrease in coke consumption and a 4 per cent increase in iron production. The plant (p. 74) will process 750 tons of coal an hour.

—A.H.A.

Metalworking Outlook—p. 21 *Market Outlook—p. 99*

Statistical Quality Cuts Inspection Costs $100,000

During the last 2½ years, Stewart-Warner effected the above savings through replacement of 100% inspection by sampling inspection of astronomical quantities of Alemite hydraulic fittings

By DAVID C. PETERSON

Director of Engineering and Manufacturing
Alemite Division, Stewart-Warner Corp.
Chicago

SPECTACULAR savings in inspection costs and the shipping of far fewer defective units are being realized by many manufacturers today through use of statistical quality control.

We find ourselves using it in ever expanding applications. Some departments using these techniques are not as yet deriving maximum benefits. In the not too distant future we intend to adopt it as standard in all departments. Our other divisions have no formal program yet, but they're observing our progress with interest.

Today's technical literature refers frequently to the new tool, statistical quality control. At times this tool may become complex; however, these articles always make reference to the accomplishments derived. Many of the articles speak of amazing results in the matter of cost reduction and quality improvement! We have not experienced these amazing results; however, I can definitely say that contributions to both cost reduction and quality improvement have been substantial in many of our departments.

There Have Been Mistakes—Our program—natural-

CORE ASSEMBLIES – DEFECTS

WEEK OF 11-7 TO 11-11

LOOSE FERRULES	𝍸	𝍸	𝍸	𝍸	𝍸	𝍸	I
REVERSED NUT	I						
BENT CORE	I						
MISSING SQUARE	I						
BURR ON CORE	II						
SHORT CORE	I						
SHORT CASING	I						
COLLAR MISSING	I						

NO INSPECTED	5375
NO DEFECTS	39
0726 PER CENT FOR WEEK	

Fig. 1—Typical tally sheet prepared by the final inspection clerk. It reveals that most of the week's defectives were loose ferrules and the ferrule crimping machine needs a thorough overhauling. No other quality problems are apparent

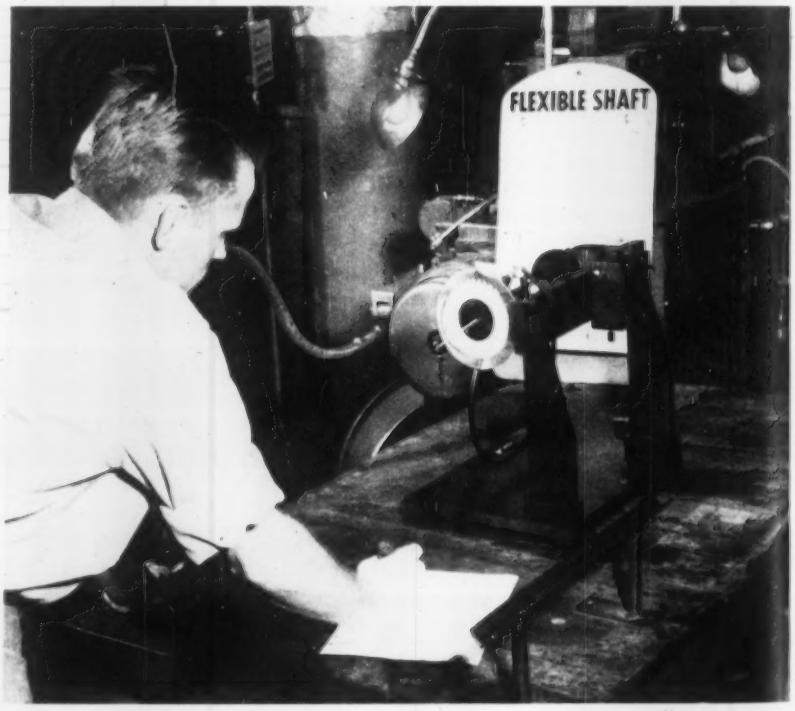


Fig. 2 (right)—Metallurgical inspector is checking amount of whip in flexible core material on an internal resistance (or differential torque) tester. Note quality control chart board behind tester

Control

X marks the spot (see cover) where quality control can take over from former tedious inspection methods. More specifically, the cover hieroglyphics refer to bar-X'' and ''R'' charts, and other standard tools of the quality control engineer, who is much in demand these days.

MIX certain statistical elements of the Gallup poll technique with advanced mathematics, plus classroom instruction of personnel, carefully thought out industrial relations and a seasoning of promotional hoopla, and you have essentially what industry, or at least a substantial portion of it, has come to know as quality control. Statistical phases have long been known and practiced by the large electrical and telephonic equipment manufacturers, as well as by ammunition supply divisions of the military services. High-speed output of large volumes of small pieces precludes 100 per cent inspection, so a continuous sampling and plotting of variations from specification keeps processing in control. Quality control provisions are being included in many military equipment contracts, particularly those involving the Air Force where it is believed that statistical quality control may permit former rigid inspection procedures at contractors' plants to be relaxed to only surveillance inspection. Effective quality control requires adequately trained personnel for proper application of the system and evaluation of results, to the end that morale of working forces may be improved as well as quality of the product, relations with suppliers and unit costs. Case histories abound of important accomplishments made through quality control. Here is one; others will follow in later issues.

ly—has not been without its mistakes. The first thing decided upon when it began was to replace all 100 per cent inspection by sampling inspection, through use of scientific sampling plans. That, we think, was a good move, but we did not complement this action by assigning some of the displaced inspection labor to chart the machines. So we still lack the necessary machine control charts in some departments. That experience should point out the necessity of retaining a part of each savings at the time it is made and using it to give the program its necessary economic balance considered essential to ultimate success of the effort.

Our main investment consisted of a quality control engineer and a quality control analyst—a book and a machine man.

The Educational Phase—Before starting the program, a great many advance plans were laid. But because of budget considerations we had no specific time table. Everything was to be "as soon as possible." Some steps of the program lagged for lack of attention. The educational phase, though, (the most important part) is coming along according to advance planning. The production department recently decided to avail itself of the opportunity offered for foreman training. Tool engineering had a number of people attend a bird's-eye view series of class sessions on control charts. We realize that only half the statistical quality control tool kit is made up of inspection tools. Included also are powerful tools to help the process engineer, design engineer, and the research development man. Our courses are designed primarily for inspectors, and will soon be informally expanded for other interested technical people.

Our largest apparent saving made was through replacement of 100 per cent inspection by sampling inspection of Alemite hydraulic fittings, production of which runs into astronomical figures. Many of these fittings contain a ball and spring; they are heat treated and plated. We use Dodge-Romig sampling tables in this application, and the results obtained have been most gratifying. We think we've saved $100,000 in inspection labor during the 2½ years of operation under the new plan.

Along with the financial saving we achieved a higher quality product. What's more important, we now have assurance as to the quality level of shipments leaving our plant.

Definition Of Defects—We set our quality requirements in the fitting department at a maximum of 0.1 per cent defective for major defects and 0.25 per cent for minor defects. A major defect is one that may cause minor damage to equipment on which the fitting is installed. A minor defect is one which will prevent assembly of the fitting to the equipment (it may also be a defect affecting the part's appearance). In either case, it is thrown out as unusable.

The reduction of rejections and the accompanying reduction of number of parts being returned for reworking eased the burden for operating and inspection departments. Institution of the controls made the job of meeting the operating budget easier.

Present policy on reworking parts, demands that the error-making department effect the rework, so records do not indicate a true pattern of this rework

TABLE SA-2.0

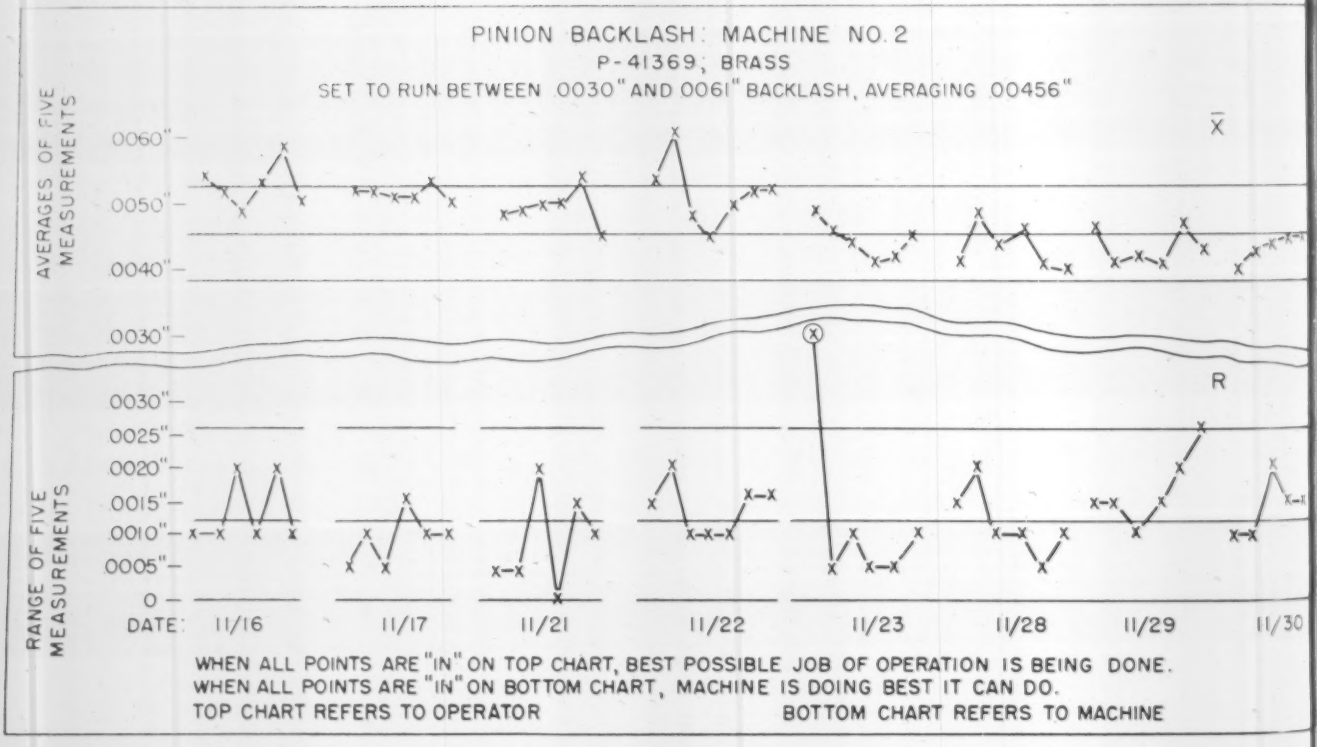
AVERAGE OUTGOING QUALITY LIMIT = 2.0%

Process Average % / Lot Size	0–.04 n	c	Pt%	.05–.40 n	c	Pt%	.41–.80 n	c	Pt%	.81–1.20 n	c	Pt%	1.21–1.60 n	c	pt%	1 n	–2.00 c	Pt%
1–15	All	0	...	All	0	...	All	0	...	All	0	...	All	0	...	All	0	...
16–50	14	0	13.6	14	0	13.6	14	0	13.6	14	0	13.6	14	0	13.6	14	0	13.6
51–100	16	0	12.4	16	0	12.4	16	0	12.4	16	0	12.4	16	0	12.4	16	0	12.4
101–200	17	0	12.2	17	0	12.2	17	0	12.2	17	0	12.2	35	1	10.5	35	1	10.5
201–300	17	0	12.3	17	0	12.3	17	0	12.3	37	1	10.2	37	1	10.2	37	1	10.2
301–400	18	0	11.8	18	0	11.8	38	1	10.0	38	1	10.0	38	1	10.0	60	2	8.5
401–500	18	0	11.9	18	0	11.9	39	1	9.8	39	1	9.8	60	2	8.6	60	2	8.6
501–600	18	0	11.9	18	0	11.9	39	1	9.8	39	1	9.8	60	2	8.6	60	2	8.6
601–800	18	0	11.9	40	1	9.6	40	1	9.6	65	2	8.0	65	2	8.0	85	3	7.5
801–1000	18	0	12.0	40	1	9.6	40	1	9.6	65	2	8.1	65	2	8.1	90	3	7.4
1001–2000	18	0	12.0	41	1	9.4	65	2	8.2	65	2	8.2	95	3	7.0	120	4	6.5
2001–3000	18	0	12.0	41	1	9.4	65	2	8.2	95	3	7.0	120	4	6.5	180	6	5.7
3001–4000	18	0	12.0	42	1	9.3	65	2	8.2	95	3	7.0	155	5	6.0	210	7	5.6
4001–5000	18	0	12.0	42	1	9.3	70	2	7.5	125	4	6.4	155	5	6.0	245	8	5.2
5001–7000	18	0	12.0	42	1	9.3	95	3	7.0	125	4	6.4	185	6	5.6	280	9	5.1
7001–10,000	42	1	9.3	70	2	7.5	95	3	7.0	155	5	6.0	220	7	5.4	350	11	4.8
10,001–20,000	42	1	9.3	70	2	7.6	95	3	7.0	190	6	5.6	290	9	4.9	460	14	4.4
20,001–50,000	42	1	9.3	70	2	7.6	125	4	6.4	220	7	5.4	395	12	4.5	720	21	3.9
50,001–100,000	42	1	9.3	95	3	7.0	160	5	5.9	290	9	4.9	505	15	4.2	955	27	3.7

Fig. 3 (above)—Single sampling lot inspection table which is based on stated values of average outgoing quality limit. Reproduced by permission of Bell Telephone Laboratories Inc. from *Sampling Inspection Tables* by H. F. Dodge, and H. G. Romig, published by John Wiley & Sons Inc., 1944

Fig. 4 (left)—Percentage defective "p" chart used to compare quality from five lines for flexible shaft assemblies

Fig. 5 (below)—Bar X $(\overline{X})$ and R charts which reveal the average and range, respectively, of five backlash measurements between a pinion gear and a standard mating gear



labor cost. But we do know that the saving can be classed as substantial.

Four Men's Wages—Another example of effected savings is shown by our flexible shaft department's experience. Through application of statistical quality control we were able to reduce inspection cost by four men's wages. Simultaneously, quality of flexible shaft assemblies submitted to final inspection improved from an average of more than 1 to less than 0.5 per cent defective.

In manufacture of flexible shafts, another benefit was derived through application of the control program. One component—the raw flexible shafting commonly called core material—is a purchased item, and wide quality variance caused undue difficulty in the finished product. Basic objection appeared in the nature of speedometer oscillation and noise; if one end of the shafting is turned evenly, the other end would turn unevenly, producing a condition called whip. These factors made us decide to begin our statistical quality control program through inspection of incoming core material. The first step was to buy a testing machine that would measure whip tendency. It allowed us to set a specified maximum whip allowable in terms of inch-pounds differential torque. We then set up "bar X and R charts" on differential torque measurements obtained from incoming material and used them to determine its disposition for acceptance or rejection. Use of these charts not only raised the quality level of incoming material; it provided a barometer to indicate the direction in which the level was headed at any time. We also had a good indication of degree of quality that could be expected from a supplier when things were going well in his own plant.

The Benefits—Gains experienced in the flexible shaft operation were: All defects reduced to less than 0.5 per cent; incoming purchased material from source A—defects reduced from 50 to 0.1 per cent; incoming purchased material received from source B—defects reduced from over 10 to approximately 3 per cent; inspection department operated with four less men. Indirectly we were influenced to purchase a supplier's plant to our financial benefit.

One fact is of the utmost importance: Statistical quality control is not totally responsible for the gains experienced in flexible shaft operations. Various other departments of the organization, worked diligently to correct many scientific and operating problems involved in this operation. Besides, our vendors exerted a great deal of effort and patience in correcting defects apparent in their products.

Homework and Quizzes—The matter of educating foremen and inspection supervisors though time-consuming is an absolute necessity in statistical quality control. Our plan provides that each foreman receive 5 to 6 hours of lectures, demonstrations and movies. It is patterned after Ford Motor's Four-Session course. For our inspection supervisors and inspectors, we provide a much longer course. Three of these courses are in progress, and we expect to have more in the future. Classes are held on company time; they are of one hour's duration and meet once a week. Homework and class quizzes are included.

Supervisory personnel cannot be expected to learn much of the subject outside the class sessions because of their regular daytime plant work. In the one-hour class period, only ten to 20 minutes are allocated to presentation of new material; the remainder of the session is devoted to review and practice problems. Such caution is well justified, because we want the men to learn the subject thoroughly.

What About Homework?—We've found approximately 80 per cent of the assignments are turned in. In our course, homework is merely a token assignment requiring an average of from 30 minutes to an hour per week. Originally, our course provided for 5 hours per week; that was excessive: No homework was done.

Our monthly quality control report was instituted about a year ago and presents a quality chart on each department in which some activity is being carried on. These are generally "per cent defective" charts and each point usually represents the average

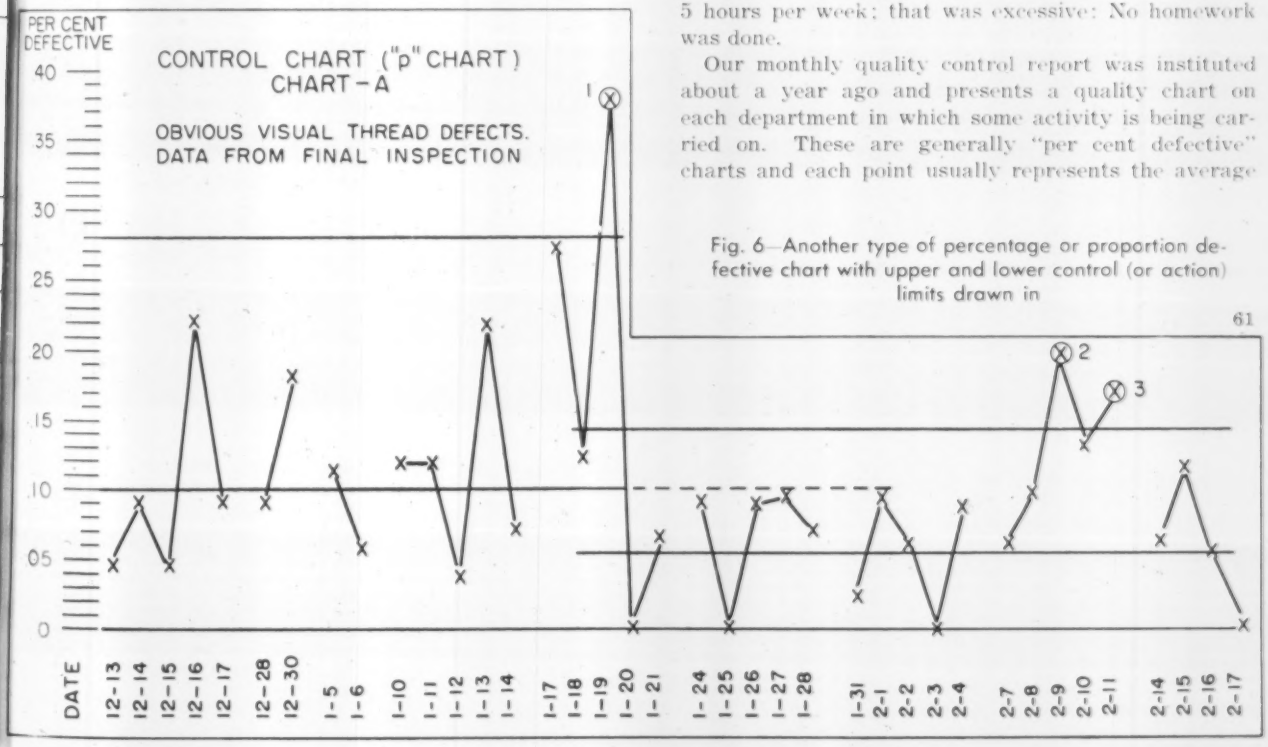


Fig. 6—Another type of percentage or proportion defective chart with upper and lower control (or action) limits drawn in

monthly quality level, or, in a few cases, for one week. It was such a chart from the monthly report that first called to management's attention that one of our core material suppliers was making premium material; we eventually acquired the supplier's facilities.

The Program's Operation—This is our approach:

1. Record final inspection results (see Fig. 1).
   A. How many made?
   B. How many checked?
   C. Defectives—how *many total*? How *many* of each kind?
   D. Calculate per cent defective.
2. Specify an acceptable average per cent defective in writing.
3. *If better* than our goal, use Dodge-Romig *A.O.Q.L.* sampling *tables* set to a specified goal, at final inspection. Sort all rejected lots with replacement. That will insure the least amount of inspection labor to provide quality assurance.
4. If less than our goal, select the worst items from the defect classification and put a "p" chart on each. If among these there are some *dimensions* that can be accurately measured in magnitude, such as *length, diameter*, weight, torque, pressure, *time, temperature, indicator, or meter reading*, etc., put bar X and R charts right at the *machines*. *Use the* charts to investigate the process (machines, men, *materials*, etc.), when an out-of-control point occurs. The top chart, (bar X), often reflects quality of work of the operator or setter while the bottom chart (R) is usually more intimately related to the machine.

For those defects best measured by stating whether they are present or absent, try "p" charts right at the machines. These charts also are used as guides for investigation and action.

When the process gets better than the goals, use Dodge-Romig A.O.Q.L. sampling tables at final inspection and discontinue those control charts that served their purpose.

Sampling Tables—A Dodge-Romig sampling table (see Fig. 3) looks more formidable than it really is. It is based on a chosen value of 2.0 per cent defective. Each chosen quality level has its own table.

To illustrate: Suppose you wanted to guarantee that an out-going quality level will average at worst 2 per cent defective. Current records show the process is actually producing 1.1 per cent defective on the average. Lot sizes are 1500 pieces.

First, the proper table must be selected. In this case it is the 2.0 per cent table, reproduced here. The column headed 0.81-1.20 is referred to since the process is producing 1.1 per cent defective, which falls between 0.81 per cent and 1.20 per cent. The 11th line, headed 1001-2000 is referred to because the lot size of 1500 falls between 1001 and 2000. The inter-section of the designated column with the designated line gives: n = 65, and c = 2. That means take a random sample of 65 pieces from each lot. If two or less defects are found in the sample, pass the lot as is. If more than two defects are found, reject the lot to be sorted.

If the sorting is always done when indicated, the average outgoing quality level will with certainty be less than 2 per cent defective.

The pair of charts in Fig. 5 are known as bar X and R charts, written $\overline{X}$ and R. The top chart is the bar X chart and the lower, the R chart. In this case the measurement concerned is backlash in inches between a pinion gear and a standard mating gear, measured to the nearest 0.0005-inch.

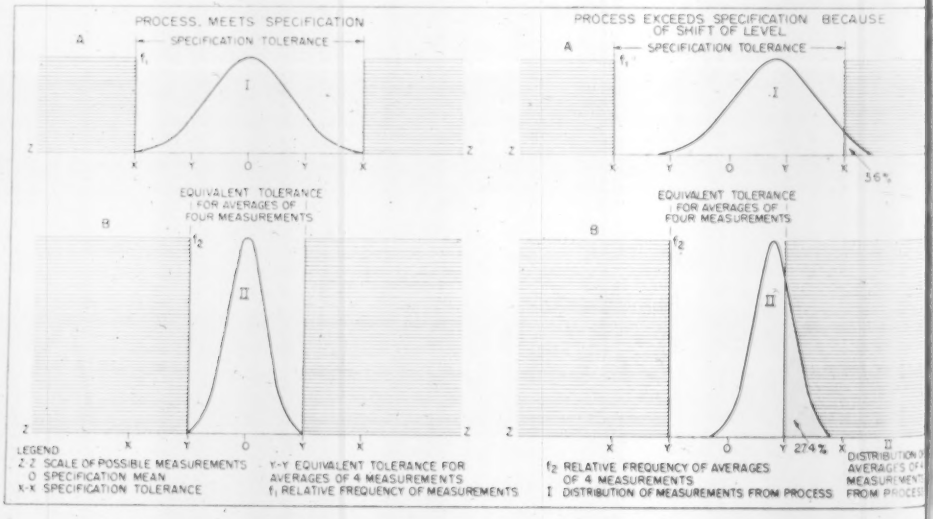
Measuring Backlash—Each point on the top chart is an average of five backlash measurements. The letter X usually signifies a measurement and the bar above a symbol indicates an average, so the symbol $\overline{X}$ means an average of measurements.

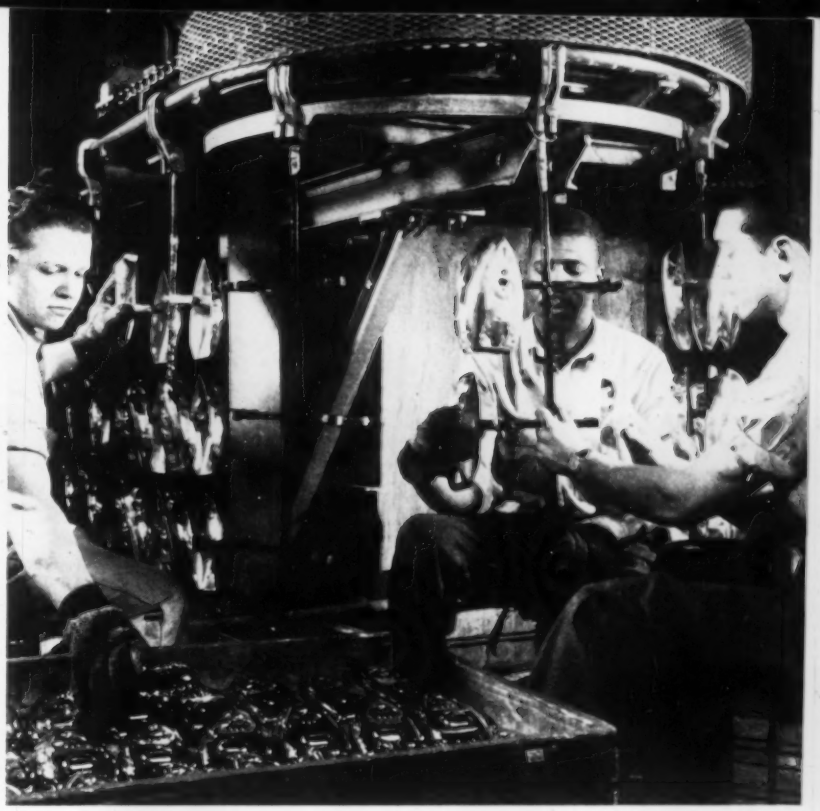
Each point on the lower chart is the range of the same five backlash measurements. The range is the difference between the largest measurement and the smallest measurement and is signified by R.

In the illustration, the center of the bar X chart is set at a chosen standard value of 0.00456-inch backlash. Naturally, backlash (*Please turn to Page* 80)

Fig. 7 (left)—Typical frequency distribution used to tally one measurement for gear thickness on one gear. Note that about 15 per cent of the gears are too thick and the distribution centers approximately 0.0005-inch too high

Fig. 8—Graphical illustration of a process meeting and not meeting a specification due to a shift of level, such as occurs due to tool wear. Charts based on averages are much more efficient in detecting shifts in level than those based on measurements


PROCESS MEETS SPECIFICATION
SPECIFICATION TOLERANCE
EQUIVALENT TOLERANCE FOR AVERAGES OF FOUR MEASUREMENTS
PROCESS EXCEEDS SPECIFICATION BECAUSE OF SHIFT OF LEVEL
SPECIFICATION TOLERANCE
EQUIVALENT TOLERANCE FOR AVERAGES OF FOUR MEASUREMENTS
LEGEND
Z-Z SCALE OF POSSIBLE MEASUREMENTS
O SPECIFICATION MEAN
X-X SPECIFICATION TOLERANCE
Y-Y EQUIVALENT TOLERANCE FOR AVERAGES OF 4 MEASUREMENTS
f1 RELATIVE FREQUENCY OF MEASUREMENTS
f2 RELATIVE FREQUENCY OF AVERAGES OF 4 MEASUREMENTS
I DISTRIBUTION OF MEASUREMENTS FROM PROCESS
II DISTRIBUTION OF AVERAGES OF 4 MEASUREMENTS FROM PROCESS



Automatic plating of electric iron parts at Procter Electric Co., Philadelphia. Men are loading and unloading parts

Automatic Plating

Meets Stiff Defense Production Standards

Close tolerances in plate thickness, better distribution and other quality improvements are provided by modern high production plating equipment. Well-designed machines set up in a suitable line, with or without corollary semi-automatic or hand-operated plating tanks can handle various sizes and shapes of work

By JOHN V. DAVIS
Chief Engineer
Udylite Corp.
Detroit

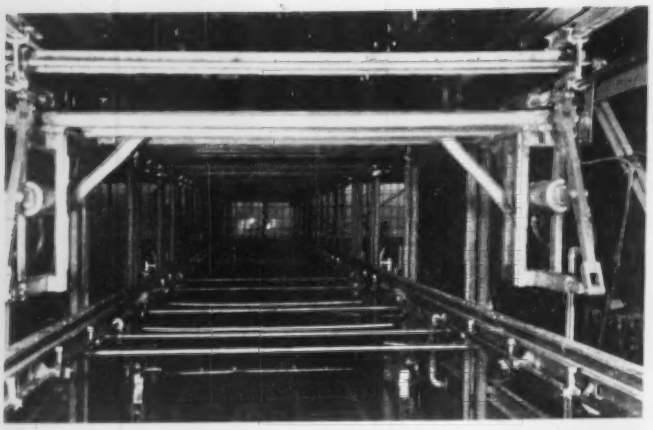
AUTOMATIC equipment can effect savings in production line plating operations that may not be apparent at first unless one stops to consider all the advantages it offers. Full automatic conveyors, because of their ability to carry a number of different types of parts through a predetermined cycle of treatments, automatically, depending on the finish to be applied, reduce the cost per unit by eliminating individual handling through the various treatments.

The path work follows in traveling through the automatic machine may be used to classify the three general types of automatic machines built by several companies for the plating industry. These are: (1) Straight line (2) return and (3) rotary. Automatic plating increases production in many cases because the flow of work is constant throughout the productive period. This enables the production manager to plan more accurately his daily output in advance. Selection of proper equipment for the job is important in achieving maximum economy and advantages.

Straight Line Type—In the straight line machine the plating rack may be loaded on the work carriers at one end of the machine and carried through the various tanks in the cleaning, rinsing, pickling, plating, rinsing and drying operations and unloaded at the opposite end of the machine. Tanks may be placed very close together. Most of the mechanisms may be either above or beside the row of tanks; the whole installation forms a very compact unit that is easy to service and maintain.

All other factors being equal, the straight line type machine requires the least floor space and the most head room. However, if the ceilings are low and head room is not available, the design may be altered to send the work carriers back alongside and in such a case this design may then require more floor space than either the return type or the rotary.

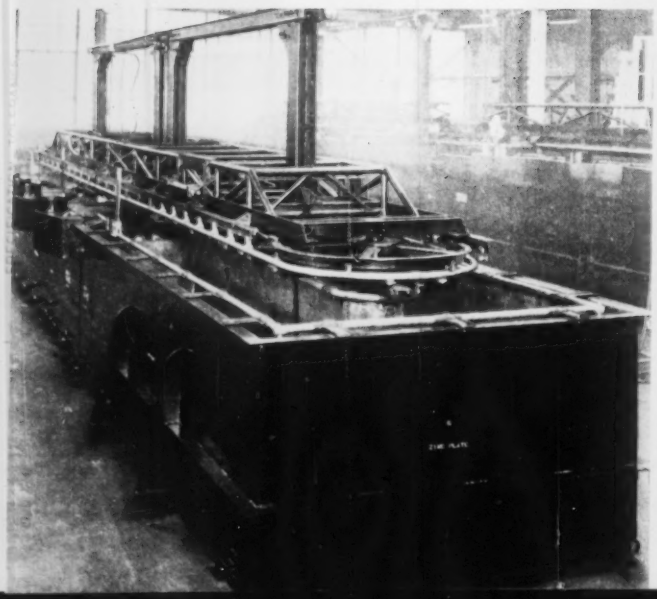
The straight line unit can be designed for very large racks and heavy loads and is generally considered a heavy-duty machine. It also permits solution maintenance and anode replacement. Several



Above—Straight line type full automatic plating machine. This unit can be designed for very large racks and heavy loads

Left—Special rack with inside anode used at Bendix-Westinghouse for interior plating. Rack is attached to machine's work carrier

Below—Full hydraulic drive Udylite full automatic single row return type plating machine. This unit is frequently operated by one man. It is adaptable to the single conveyor system used in many plants



rows of racks may be run through this type of plating machine with three or four racks side by side on each carrier. However, the wide tanks may cause ventilation difficulties. Where first cost, installation cost, and maintenance are not the greatest consideration, this type of automatic plating machine is generally most desirable. It is particularly advantageous in plating large and bulky parts where a high rate of production must be maintained.

Return Type—This type of machine is a compact medium duty machine. Sometimes it is necessary to juggle tanks to meet requirements at the ends. It will accommodate racks of medium size, generally of the order of 12 to 18 x 36 x 6 inches thick; loaded racks will average 35 to 50 pounds.

The machine is easy to install and may be shipped almost ready to use. As a general rule this type equipment requires less head room than other types, and is easy to ventilate. Because some models have mechanisms between rows of tanks, it is not so completely accessible as the straight line machine. More machines of this type are used than any other; they are generally one or two row units.

Plater Runs the Show—Operation of the Udylite machine of this type is controlled by simple adjustments of the hydraulic valve mechanism. The work carriers ride directly on a one-piece cathode rail which acts as a support and conductor. When transfers are required a section of the rail is hydraulically lifted, raising the work from the tank; the work carrier is moved by the hydraulic pusher mechanism and the work lowered into the next tank. This is done without sway or jerking, and makes possible utilization of all available tank space.

The plater has complete control of the transfer cycle. Lifting, transferring and lowering may be controlled separately at any rate desired using the hydraulic control mechanisms. Also the three transfer motions on the automatic unit can be regulated independently to reduce drag out and solution contamination.

A principal feature of the single row machine is its economy of operation and its adaptability to the single conveyor system used in many plants. The single row machine is easier to service; ventilation and solution control are simpler. Single row machines are often no more than 10 and sometimes less than 7 feet wide. This type machine is built to low or extremely high lifts, as the nature of the parts being processed requires. Tanks can be placed close together to shorten the total length and save floor space, as a result of the flexibility permitted in spacing work carriers. Sometimes it may be desirable to use work carriers equipped with auxiliary anodes for interior plating to secure best results.

Output Doubled—Chief advantage of the double row automatic plating machine, is doubled production without a proportionate increase in floor space occupied. While these machines have the same general features of the single row type, they are especially adaptable to plant locations where length must be kept to a minimum.

Based on a talk the author presented before the Niagara Falls Section, Electrochemical Society at its regular November, 1950, meeting.

Wherever plant dimensions permit, the single row machine is definitely preferable and more economical. The use of two single row machines instead of one double row where large production requires additional plating capacity is desirable.

Some of the advantages of using two single row machines in place of one double row are: (1) The single row can be shipped assembled and ready to run whereas the double row cannot; (2) plating rooms are not tied up by long and costly installation work; (3) load and unload spaces in the single row machines give more working area and convenience in rack handling, requiring one-half the manpower to operate; (4) two single row machines require only one storage or mixing tank between them, one-half the size; (5) ventilation is better because of the smaller tank width, requiring lower slot velocity; (6) in case one single row machine is down for repair or solution change, the other will be in operation; (7) one single row machine can be purchased at a time and another added as production needs require; (8) single row machines offer low maintenance costs because of the easy access to all parts and the overall simplicity of the mechanism.

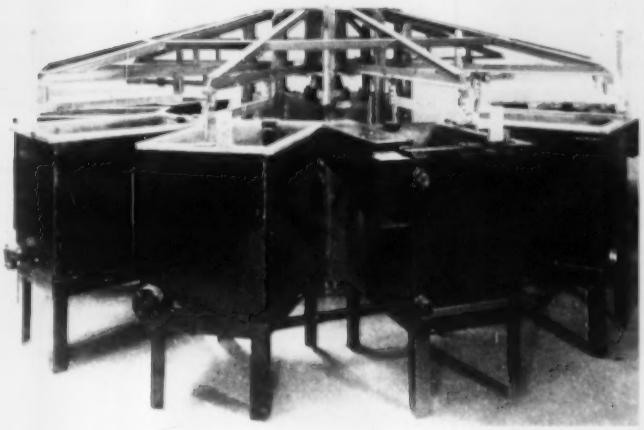
The single row automatic plating machine may be equipped with an agitated non-lifting section. This mechanism provides the cathode rod agitation. The device which agitates the work smoothly back and forth is installed on a separate section of the carrier rail and is actuated mechanically by a motor and speed reducer. The device was developed particularly for nickel and copper plating.

Rotary Type—Arrangement of tanks around this type of machine is similar to a cart wheel. The tanks may be arranged around the center of the machine radially like the spokes in a wheel, or end-to-end like the rim of a wheel. In each case a certain amount of space is lost either between the sides of the tanks or between the tanks and the center of the machine. Either arrangement permits easy access to the tanks to install ventilation and to service the solution as well as to replace anodes. It has very few moving parts and thus requires very little maintenance.

The rotary type needs more head room and floor space than other types; however, this is compensated for by the extremely heavy loads and the large racks the machine can handle, based on a hydraulic drive mechanism. The machine may be arranged so that the load and unload points are together.

Small Full Automatic Machines—Small, fully automatic plating machines have special advantages in certain production operations. These units are useful for cadmium and zinc plating and also with other metals. One machine manufactured by Udylite, known as the junior full automatic, is completely automatic having nine stations: (1) Electroclean; (2) cold rinse; (3) acid dip; (4) cold rinse; (5) plate; (6) cold rinse; (7) hot rinse; (8) dry; (9) load and unload. Every phase of the cycle is adjustable, which provides uniformity in the plated products.

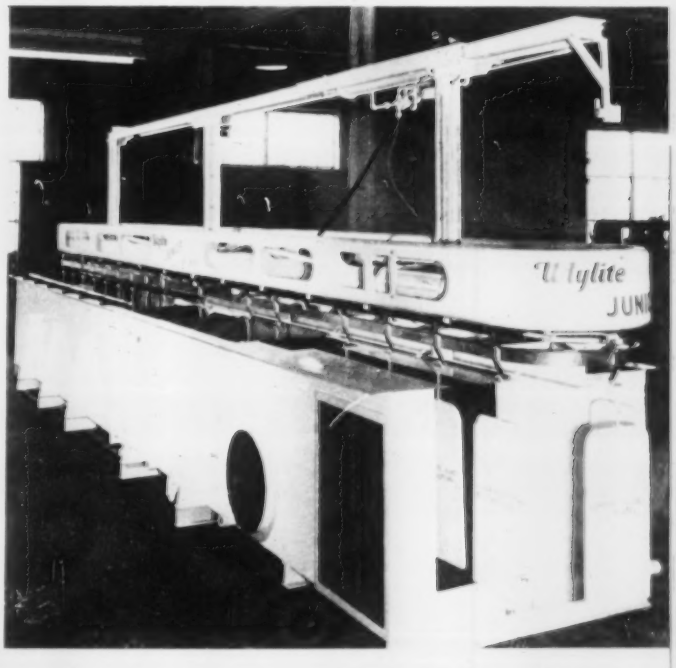
A fully automatic machine does not require the constant attention of experienced platers. In some cases, after the cycle is achieved, the machine is operated by a regular shop man. The smaller machines are lower cost and offer all the advantages of the larger units within its limits of capacity and current consumption.



Large capacity full automatic rotary plating machine used in operations where the rate of production is not the major factor and where parts to be plated are large and cumbersome, such as airplane propellor blades

Other Advantages—Size of the tanks in a full automatic plating machine may be determined by the requirements of the job rather than by the length of a man's arm, the tanks may be deeper, anode centers may be either wider or narrower, and no space is

This junior full automatic type plating machine can handle up to 100 racks of work per hour. It has nine stations for electrocleaning, cold rinse, acid dip, cold rinse, plate, cold rinse, hot rinse, dry, load and unload



wasted with terminals or bus bars. There are no limitations on racks based on the amount of weight an operator can lift with his arm outstretched as is the case in manual operations.

The racks may be built with heavier copper and insulation where needed. This can result in less internal heating and longer life. Rack insulation and contacts last longer and maintenance is lower in automatic machine plating. In hand operations, it may be necessary to space the anodes wider than desirable in order for the operator to remove the parts without danger of striking the anodes; this may result in a wider tank than the work requires and wasted floor space.

Automatic equipment shows advantages in reducing drag-out and minimizing the possibility of contamination of the plating baths. The amount of drag-out can be reduced by lifting the racks from the solution at a rate that permits the surface of the solution to strip the droplets from the parts as they emerge. After adjustment to the ideal rate, the full automatic will maintain it constant day after day, and can effect an important savings in drag-out loss over hand operations where the rate of work removal will vary. Also, the possibility of contamination can be minimized by removing less solution as drag-out; also the amount of rinse water needed can be reduced in many cases.

Better Product Uniformity—Automatic equipment makes for uniformity of product. Every part receives exactly the same treatment and it is much easier to trace the trouble when plating is not up to standard. Thus, the machine cannot skip a rinse or leave a rack in the acid dip too long, etc. Automatic equipment makes the plating room a more desirable place to work. The errors due to the human element will be reduced. A definite schedule can be set up for solution sampling and anode replacement.

A full automatic can show an impressive saving in overall factory cost by reducing the rejects and lowering the down time required to trace the source of trouble and correct it.

Cleaning Aids Corrosion Proofing

OXYACETYLENE FLAME cleaner supplied by Union Carbide & Carbon Corp., New York, was used to clean every inch of the 12.6 linear miles of welded "ribbonrail" going into Denver & Rio Grande Western Railroad's Moffatt tunnel. Set up on the welding line the machine quickly removed moisture, scale and dirt from the rail before a seal coat of rust-inhibiting paint was applied. Applying paint to a warm rail causes it to flow easily and stay on longer

Slide Chart Picks Right Stainless

Technical data and information on workability of stainless steels is contained on a pocket-size slide chart prepared by Carpenter Steel Co., Reading, Pa. Chart includes a standard analysis table of stainless steels, together with their corresponding AISI type numbers, and gives relative fabricating data on the steels for a variety of operations. Included are: Soldering, welding, roll forming, hot and cold riveting, forging, buffing, deep drawing, blanking and perforating. Machinability, as measured by a range of low and high speeds of turning in surface feet per minute, is also given.

Specifications for forging, annealing and drawing Carpenter stainless steels as well as information on corrosion resistance, Brinell and Rockwell hardness ranges after drawing, tensile strength, elongation, scaling temperatures safe for continuous service and whether steels are subject to intergranular corrosion are other chart features. Forms in which the steels are produced are listed.

ASTM Lube Standards Released

Most of the American Society for Testing Materials standards, test methods, and specifications on petroleum products and lubricants are included in the latest compilation prepared by the society's committee D-2 on petroleum products and lubricants.

It gives in the latest form 125 standards, including 112 test methods, 8 specifications, 3 lists of definitions relating to petroleum, specific gravity, and rheological properties of matter, 2 tentative recommended practices for the purchase of uninhibited mineral oil for use in transformers and in oil circuit breakers and for designating significant places in specified limiting values and other material.

Copies of the 780-page book may be secured from the society, 1916 Race St., Philadelphia 3, Pa. at $5.50 each with a paper cover, or $6.15 with cloth cover.

Outlines Flexible Shaft Selection

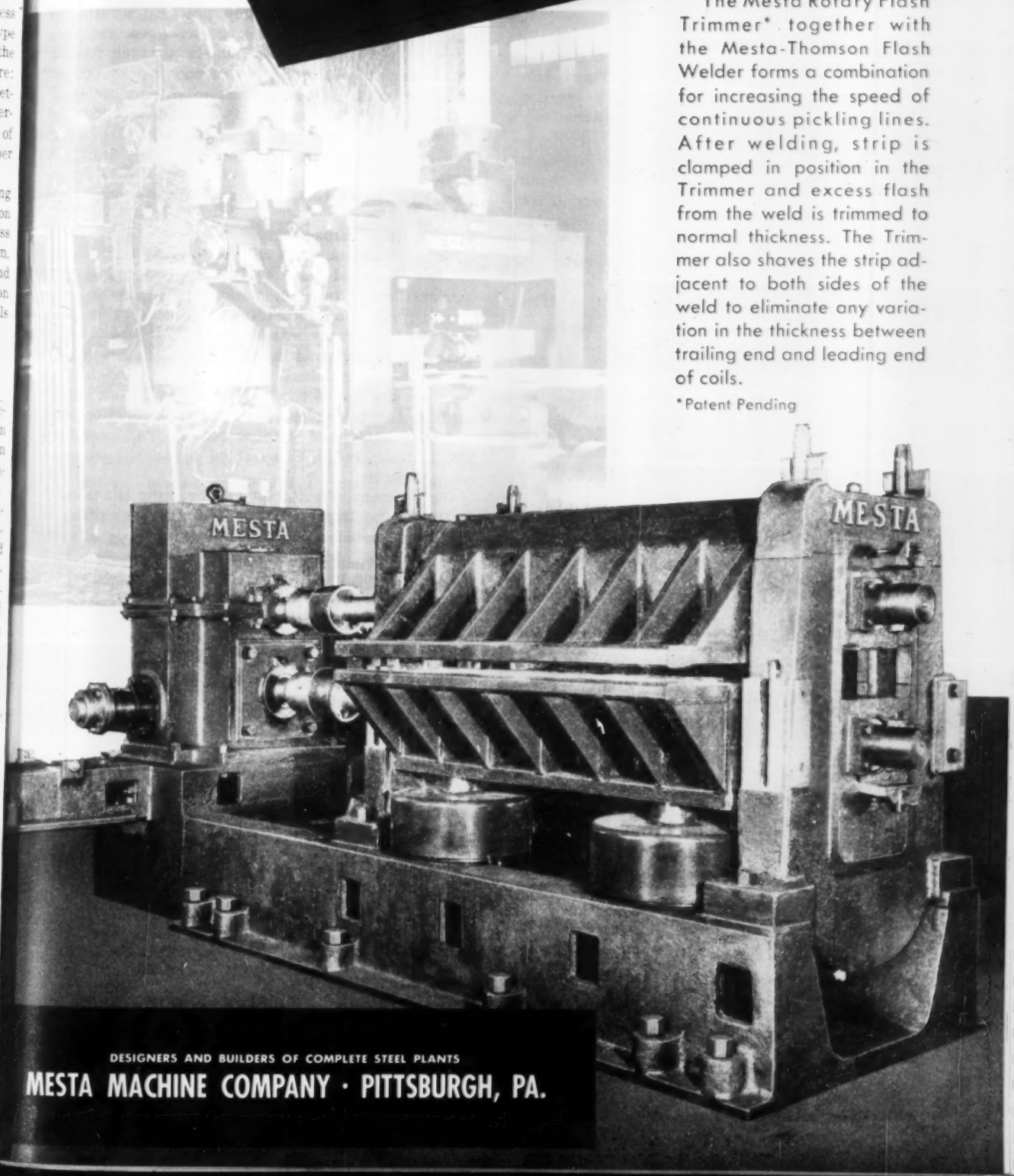
Basic principles of flexible shaft selection and application are outlined in a 12-page booklet issued by S. S. White Dental Mfg. Co., 10 E. 40th St., New York 16, N. Y. It includes latest developments in flexible shafting and is fully illustrated with drawings, photographs and tables showing construction details and performance data of both power drive and remote control types.

Instructions are given on how to select shafts for specific application. Also included is a description of the variety of sizes and types of flexible casings available for use with the shafts. These include metallic, fabric, rubber and plastic covered casings.

MESTA
Rotary Flash Trimmer

The Mesta Rotary Flash Trimmer* together with the Mesta-Thomson Flash Welder forms a combination for increasing the speed of continuous pickling lines. After welding, strip is clamped in position in the Trimmer and excess flash from the weld is trimmed to normal thickness. The Trimmer also shaves the strip adjacent to both sides of the weld to eliminate any variation in the thickness between trailing end and leading end of coils.

*Patent Pending



DESIGNERS AND BUILDERS OF COMPLETE STEEL PLANTS

MESTA MACHINE COMPANY · PITTSBURGH, PA.

ZIRCONIA REFRACTORY
Good to 4600° F

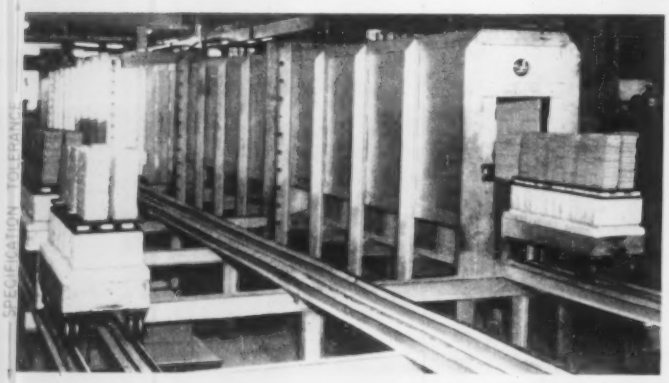
All uses for this material have not been fully developed, but those investigated to date offer definite advantages to many varied processes

PROMISING to open an entirely new era in ultra-high temperature chemical processing is the new fused stabilized zirconia refractory recently unveiled by Norton Co., Worcester, Mass. It will successfully withstand industrial temperatures up to 4600° F.

Uses to which the material can be put include a variety of molded shapes such as: Furnace lining bricks for gas synthesis at high temperatures in the chemical industry; setter plates for firing titanates used in the construction of capacitors in the electronic equipment field; heating elements for electric furnaces; containers and conveyers for molten steel; thermal insulation (high frequency induction or resistor wound furnaces).

The new product is paradoxical. Unlike most materials, it is a poor conductor of electricity at low temperatures but an excellent electrical conductor when subjected to high heat. In spite of its high bulk density, it is a low conductor of heat and, therefore, a superior thermal insulating material.

In recent years the trend in both research and production processes has been toward decidedly higher temperatures. In most cases, raising the temperature has meant greater yields and increased efficiency. Improved or new products have often resulted from operating at higher temperatures. This trend thus created a demand for special refractories which could be used at temperatures far in excess of anything at which ordinary refractory materials can be operated.



This type fast cycle tunnel kiln is used for firing fused stabilized zirconia batts containing barium titanate base material used for capacitors in television, radar, radio, and other communication equipment. Photo courtesy Harper Electric Furnace Corp.

Zirconia (zirconium oxide—ZrO_2) comes from zircon which is found as a natural mineral in Australian and Florida beach sands. Zirconium is one of nature's basic elements. Another source is Brazilian baddeleyite ("zirkite"), a naturally occurring zirconium oxide.

Little need for the superior qualities of zirconia existed until World War II. Since that time industry has been turning more and more attention to high temperature processes and reactions with the result that there is a rising and insistent demand for zirconia refractories as the only practical solution to many problems. Examples of processes requiring zirconia are the Farington-Daniels nitrogen fixation process, manufacture of glass furnace blocks, conversion of natural gas to ethylene, propylene, acetylene, etc., sintering of tungsten, and the manufacture of titanate dielectrics.

In containers and conveyors for molten steel, zirconia's low reactivity with steel, thermal shock resistance, and low thermal conductivity are all-important attributes.

Laboratory furnaces have been constructed using stabilized zirconia tubes as resistors, thus employing the low electrical resistivity of the material at high temperatures. Its high melting point allows use of these furnaces to at least 4000° F and probably much higher. Its low thermal conductivity was utilized in construction by insulating with several inches of Norton insulating stabilized zirconia grain. Though these resistors are not yet being used in industrial applications, the principles of furnace construction have been delineated and with careful design, large electric furnaces could be operated to 2200°C with zirconia resistors.

Development of setter plates for firing titanates illustrates the importance of crystal composition of stabilized zirconia. Plates composed entirely of cubic or "stabilized" crystals cracked in one or two heating cycles due to the high coefficient of thermal expansion. Plates containing a small amount of "unstabilized" or monoclinic crystals in some cases average 150 heating cycles. A small percentage of monoclinic crystals lowers the over-all expansion and achieves resistance to thermal shock. Crystal composition of a sample of stabilized zirconia can be determined in half an hour by x-ray crystallographic methods, indirectly giving a quick check on its thermal shock resistance.

Locknuts and Their Operation

In recent years many locknuts have been designed on sound engineering principles, with special attention being given to economy of production and ease of application. Because their use is constantly increasing, the locknut section of the Industrial Fasteners Institute, Cleveland, formed in 1947, has issued a booklet on the types of locknuts and their principles of operation.

Many of the basic types are illustrated, along with views of their application. Each is described, its principle of operation stated and its manufacturer's name given.

Toothed Rubber Belt Assures Split-Second Timing

A timing belt with teeth, U. S. Rubber's latest contribution to basic methods of power transmission, makes possible fast, positive drives

Above—Fine wire reinforcement used in the belt is layed up evenly on a winding machine; this is a preparatory manufacturing step

Left—Closeup of new belt with teeth. Note positive engagement with pulley. Pulleys can be die cast, sintered, pressed or machined

GREATER uniformity in the productive rate of industrial machinery and split-second precision timing at speeds up to 16,000 feet per second are achieved by a new rubber and steel or fabric belt with teeth. Perfected after 12 years of research at the L. H. Gilmer Division of United States Rubber Co., the belt is similar in appearance to a flat belt except that it has regularly spaced rubber teeth along its inner surface. These teeth engage in corresponding grooves in pulleys.

Successful applications for the belt include high speed pumps, automatic screw machines, portable tools, electric typewriters, ditto and card-stacking machines, Navy Sonar equipment and atomic research on a neutron speed selector. On commercial sewing machines the belt has made possible 50 per cent faster operating speeds. Net increases in production are as much as 25 per cent. The belt can also be used as a functional part such as a synchronized conveyor as well as for transmitting power.

Current production at the company's Philadelphia plant is limited to specifically engineered applications. A standardized line of stock drives in both heavy and light-duty constructions will be offered, with a sufficient number of pulleys to give an adequate range of speed ratios. The belt can be made in any desired width and in a variety of materials.

In addition to its anti-slip characteristics and precision timing, the belt does not stretch. It will operate on fixed centers without take-up adjustments. Since it needs no initial tension, the device is reported to have unusually high efficiency with extremely low bearing pressure.

According to U. S. Rubber engineers, the belt requires no lubrication; however oil will not harm it. Speed ratios up to 30 to 1 are possible.

Rivets by the Piece

Following the general practice in pricing bolts, screws, self-tapping screws and tubular rivets is the Townsend Co., New Brighton, Pa., now selling its small rivets by the piece instead of by the pound. Townsend reports that some of its large consumers have been using this method for a number of years and that the new list is in response to growing demand on the part of other customers.

Boring Mill Cost Tops $600,000

Even in these days of high prices Allis-Chalmers Mfg. Co. added a machine tool that gets more than just passing notice at its West Allis, Wis., works. The new tool, a 30-foot heavy boring mill, was built by Lima-Hamilton Division, Baldwin-Lima-Hamilton Corp., Hamilton, O., and cost more than $600,000. It is the second biggest machine tool in Allis-Chalmers' shops, topped only by the 40-foot boring mill installed in 1928 at less than half the cost of the new one.

Weight of the new mill is about 500 tons and overall height is 48 feet with 37 feet above the floor line. It is also 59 feet wide and 29 feet deep. Almost a year was required to prepare the excavation and install the machine and controls. Its installation enables the company to increase capacity for manufacturing large generators, condensers, steam and hydraulic turbines.

Pushbutton controls play an important role in the machine's operations. An operator and a helper are required to operate the 36 electric motors that range from fractional to 220 hp using four control stations. Electrical controls for the mill were made by Cutler-Hammer Inc., Milwaukee, and consist of about 500 electrical devices and many electronic tubes. The control center is mounted on an elevated platform and all operating consoles (control panels) are located conveniently for operators.

The 30-foot table is driven by two 150-hp motors which share the cutting load and can be controlled over a wide speed range by an adjustable voltage system. Motors that feed the tools as the table rotates are electrically controlled, eliminating manual gear shifting through automatic shifts which can be picked by the operator with pushbuttons. Two mechanically separate motors can be electrically locked in synchronism, allowing simultaneous use of two sets of tools on the same cut and increasing the mill's metal turning capacity.

Chemical Jets Eliminate Smoke

Smoke elimination and greater combustion efficiency are reported by industrial users of Smokeater chemical jets manufactured by A Product Craftex Corp., Detroit. Several firms in the Pittsburgh area including Union Electric Steel Corp., Westinghouse Air Brake Co. and Union Switch & Signal Co., report fuel savings as well as abatement of the smoke nuisance.

Steam is taken off a header and is passed through the chemical cartridge and jet atomizer that combines air with the chemically treated steam. The chemicals cause hydrocarbons in the fire box and primary passes in the boiler to be burned off. Burning off soot and hydrocarbon results in a better heat transfer efficiency.

Smokeater uses from 65 to 80 per cent less steam and air than installation of steam and air jets as recommended by the Bituminous Coal Research Institute. It also operates on lower steam pressure and uses less jets. Ordinarily two jets are used per cartridge and each jet uses 55 pounds of steam per hour. Each cartridge is designed to hold up under 45-pound continuous steam pressure for 34 days. Chemicals used are organic in nature, contain no hydrocarbons, are noncorrosive and will not harm the boiler.

Tapered Step-Down Shafts Brushed 20% Faster

A 20 per cent increase in production, plus a uniform surface finish prior to plating is now being obtained by a large midwest sporting goods manufacturer by utilizing a new Osborn brushing method. A five-station machine using Fascut brushes manufactured by Osborn Mfg. Co., Cleveland, is solving the problem of removing heat-treat discoloration and surface imperfections on tapered golf shafts.

Tapered "step-down" design of the cold-drawn, heat-treated, alloy high-carbon, seamless steel shaft, presented problems of getting into the corners. With the former method, two or three passes were necessary to do the job. Only one pass is required now to turn out over 1500 shafts per 8 hour shift, or 10 feet of shaft per minute.

The shaft is hand-fed into the first station. A power infeed keeps it moving until it passes the last brush. The first station breaks the discoloration. Brushes prevent bridging the "step-down" corner.

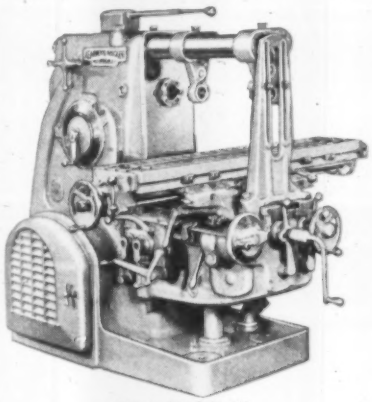
One pass through this five-station brushing machine at the rate of 1500 shafts per 8-hour day, or 10 feet of shaft per minute provides a clean surface ready for the plating process

GREATER MACHINE LIFE

Kearney & Trecker's new CK milling machines are built to give you the maximum in *Greater Machine Life*. Generously proportioned gears and shafts, plus automatic, positive lubrication easily meet overload conditions. Every component provides the rigidity and resistance to wear that the greater horsepower and heavier cutting loads of modern milling methods require. For fullest protection, column and knee are forced flood lubricated. A positive, metered pressure system takes care of table, saddle and knee ways and table feed assembly.

A new line of knee-type milling machines

KEARNEY & TRECKER MILWAUKEE CK's



New Model CK
10 hp No. 2 Plain Style
Milling Machine

YES, Kearney & Trecker's new CK milling machines are packed with design and operating features that make them *more productive, more profitable for you.*

Spindle-mounted flywheel, broad feed and speed ranges and greater horsepower with separate motor drives for spindle, and feed and rapid traverse, mean you get fullest possible benefit from modern cutting tools.

New CK columns give you greater rigidity. Compared to former columns they give you 1000 pounds more metal in heavier ribbing, in box-type, sponson construction to absorb vibration from heaviest cutting loads.

For greater production, these machines are equipped with Kearney & Trecker's famous Mono-Level Control that shortens floor-to-floor time, and materially reduces operator fatigue. New, non-glare micrometer dials help avoid costly errors in reading . . . give you a positive lock at every setting.

Automatic flood lubrication in column and knee and positive metered lubrication to table and saddle, plus generously proportioned gears and shafts assure you greater machine life.

Find out for yourself about Kearney & Trecker's new CK line of knee type milling machines . . . how they meet every demand of modern milling practice . . . how they can give you greater production at greater profit.

Sizes are No. 2, 3, 4, 5, and 6 . . . Plain and Universal styles. For complete details, contact your nearest representative or write direct. Kearney & Trecker Corp., 6784 W. National Ave., Milwaukee 14, Wisconsin.

REPLACEMENT OF OBSOLETE MACHINE TOOLS
IS AN INVESTMENT THAT MAKES BOTH DOLLARS AND SENSE

KEARNEY & TRECKER MILWAUKEE MACHINE TOOLS

MODERN COAL PREPARATION

Cuts Inland's Pig Iron Costs

This new plant, placed in operation at a time when steel is in broad demand and material for new facilities difficult to procure, assumes interest beyond that of just another new coal tipple, since it increases pig iron production while cutting cost by more than a dollar per ton in addition to conserving scarce coking reserves

INCREASED pig iron production at lower cost—without the erection of new blast furnaces—is being realized at Inland Steel Co. by operation of their new coal preparation plant at Price, Ky.

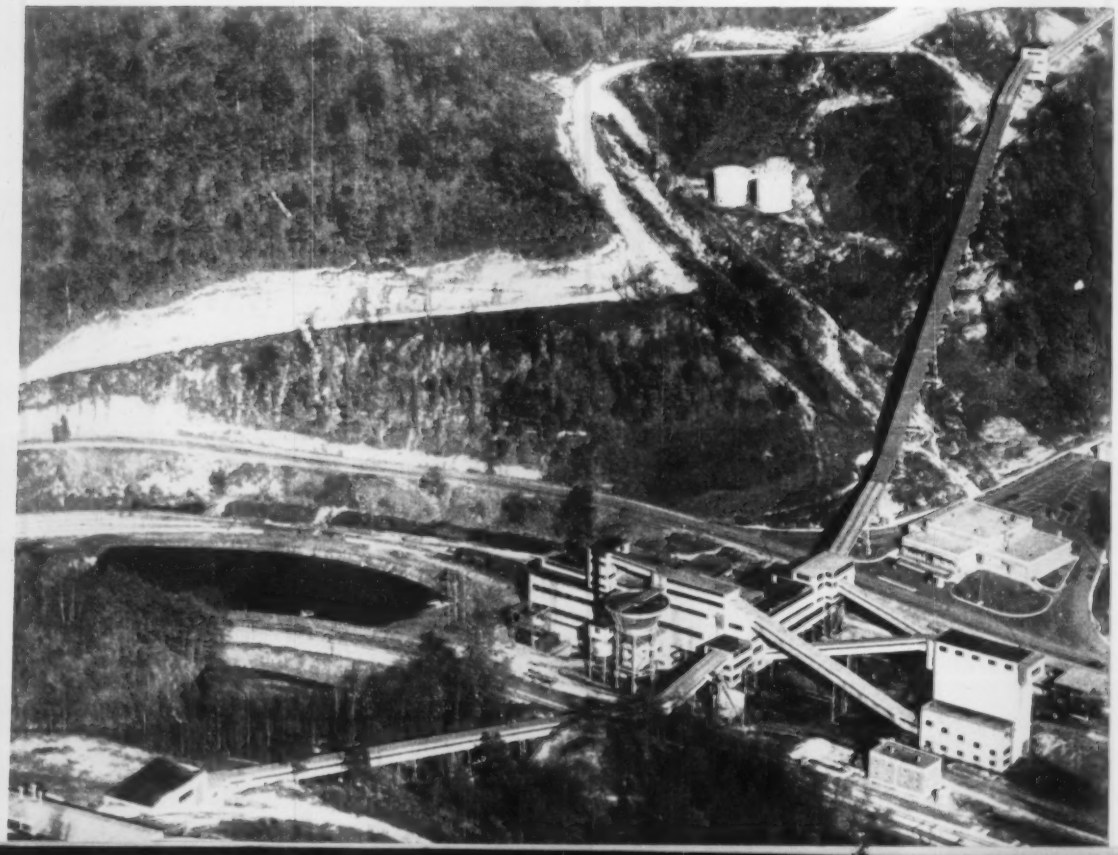
Engineers estimate the new facility will make possible a reduction from 7 to 3.5 per cent in the ash content of their metallurgical coal. Using industry's rule-of-thumb—each per cent of ash reduction is equal to 30 cents in the cost of pig iron—Inland's cost per ton of producing pig iron is now expected to drop more than a dollar.

Because coal cleaned by the new plant will contain an appreciably lower percentage of ash, slag volume produced in the blast furnace will be reduced about 10 per cent. Experience has shown that such a decrease in slag volume is accompanied by a decrease of 4 per cent in coke consumption per ton of iron, and an increase of 4 per cent in iron production.

Inland's coking coal from eastern Kentucky is inherently low in ash. Old hand loading-mining methods produced a coal with approximately 5.1 per cent ash, whereas coking coal is commonly used by other steel producers with from 7 to 8 per cent ash. By introduction of modern coal cleaning methods, Inland has further reduced this low ash-content of its coal—and thus increased pig iron production.

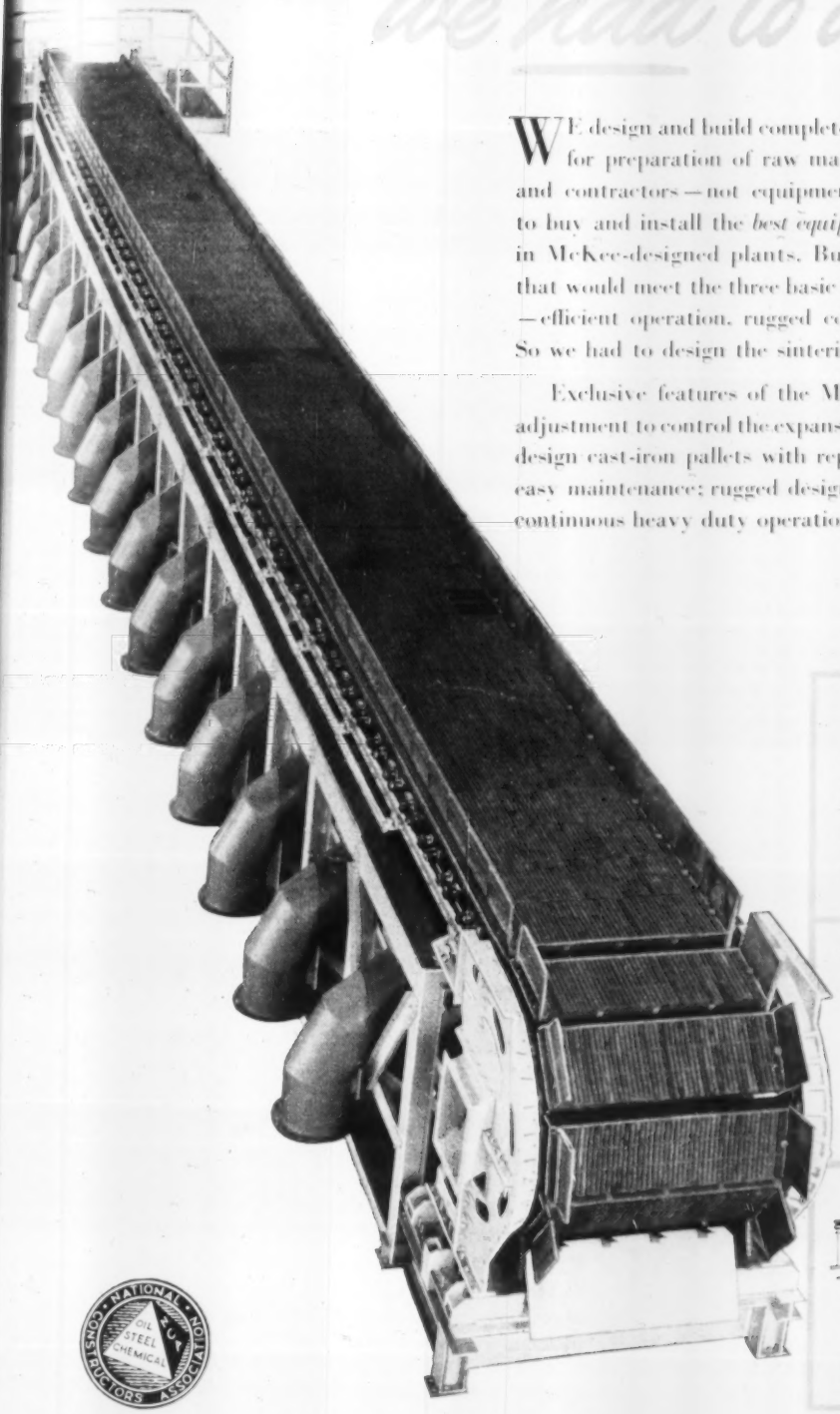
The new plant, which has been called "the most completely engineered in the country," contains the most advanced equipment for the efficient preparation of run-of-mine bituminous coal for metallurgical

High-volatile coking coal processed in this new preparation plant, located on the C&O railroad at Price, Ky., is being used to increase blast furnace and open hearth output at Inland's Indiana Harbor plant. Raw coal, fed into the plant from the headhouse, lower left, at a rate of 750 tons per hour, never stops moving until it reaches railroad cars in the valley, after sorting, crushing, washing, and blending. All mine rock and ash-forming impurities removed are conveyed up the hillside in right background to a refuse disposal bin, then trucked away. Link-Belt photos



THIS IS THE SINTERING MACHINE

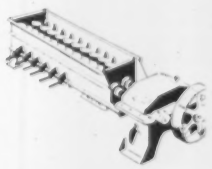
we had to design...



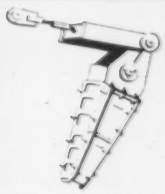
WE design and build complete sintering plants and other facilities for preparation of raw materials. We are primarily engineers and contractors—not equipment manufacturers. It is our policy to buy and install the *best equipment available*, regardless of make, in McKee-designed plants. But there was no sintering machine that would meet the three basic requirements of McKee engineering—efficient operation, rugged construction and easy maintenance. So we had to design the sintering machine illustrated here.

Exclusive features of the McKee sintering machine include an adjustment to control the expansion gap at the discharge end; special design cast-iron pallets with replaceable cast-steel end sections for easy maintenance; rugged design and construction for trouble-free, continuous heavy duty operation.

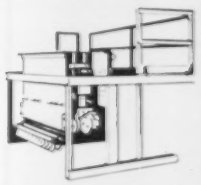
Other exclusive McKee equipment developed to meet definite needs in Sintering Plants:



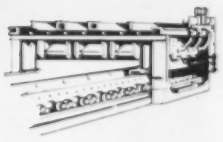
PUG MILLS



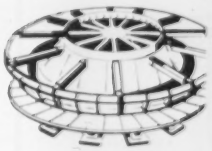
SWINGING SPOUT



AERATING FEED HOPPE



IGNITION FURNACE



ROTARY AIR COOLER

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All operations are subject to pushbutton control from a pulpit in the coal washery. Large tank in background serves as the air receiver for one of two air-pulsated washers which automatically remove the coal's ash-forming impurities

use. Designed and built by Link-Belt Co., the plant has a capacity of 750 tons of raw coal an hour. Slate, rock, fire clay and other impurities are mechanically removed. An elaborate system of blending bins, paddle mills, and conveyor systems permit the automatic mixing of sizes and analyses for delivery direct to railroad cars.

Recover More Coal—Moreover, the new plant enables its operators to engage in total seam mining at their eastern Kentucky properties. By extracting coal in fault areas which could not previously be mined at favorable costs, they not only are increasing ton-per-man production of coal, but recovering a larger percentage of the total coal deposit before withdrawing from an area.

With reduction of the coal's ash content, important advantages will follow as the resultant low-ash coke is used in blast furnaces to produce pig iron. Some of these include: Freight savings, 30 per cent decrease in coke ash, increased by-product production, improved blast furnace operation, increased pig iron production, and increased open-hearth capacity.

When selective, loading-by-hand mining is carried on, it is possible to supply coke ovens with a relaitvely satisfactory grade of coal. However, rising costs and changes in mining conditions have made it necessary to adopt mechanical loading methods. Since machine loaders cannot separate and pick out the slate, impurities in the coal as it comes to the surface increase materially with mechanical loading.

Effect of this increase in impurities is detrimental to steel production and quality. Steel plants want coal with a very low ash and sulphur content and insist that there be little variation in the percentages. One way to keep the percentage of impurities low in mechanical mining is by selective mining—that is, extracting only the best of the coal. This slows production and results in the waste and loss of coal resources. Other solution is the designing and construction of more accurate and complete preparation facilities which permit total seam mining.

Track Haulage Wins Out—To reach the new preparation plant, it was necessary to build a 4½-mile haulage tunnel to connect the Wheelwright mine with the Price mine and the preparation plant. Four passing sidings, each approximately 1500 feet long, were constructed at as near equal spacing as possible through the haulage road. Consideration was given to both track and belt haulage, but track haulage from an assembly yard underground was finally decided upon.

Facilities have been provided to handle all coal Inland produces at its own mines, as well as "foreign" coal purchased from other producers in the Elkhorn field. The plant is designed to handle and prepare run-of-mine bituminous, containing lumps up to 24 x 24 x 24 inches in size, at the rate of 750 tons-per-hour. This will all be received through the west portal of the company's mine at Price, or by railroad or truck.

Briefly stated, the plant is prepared to load out into railroad cars: Plus 5-inch lump, 5 x 3-inch egg, 1¼ x ⅜-inch stoker, and 2 x 0-inch slack, to which may be added, after crushing to approximately 1½-inch ring size, all or part of the stoker, or all or part of the lump, or all or part of the egg.

The plant is equipped with Link-Belt model 6044-E air-pulsated wash boxes for cleaning 5 x ⅜-inch coal, and Deister diagonal deck washing tables for cleaning ⅜ x 0-inch coal.

It was decided for economic as well as technical reasons to reduce moisture in the washed coal mechanically rather than by thermal drying. Therefore, Bird centrifugal filters are used to dewater the washed ⅜ x 0-inch coal, and dewatering screens are used for the 5 x ⅜-inch.

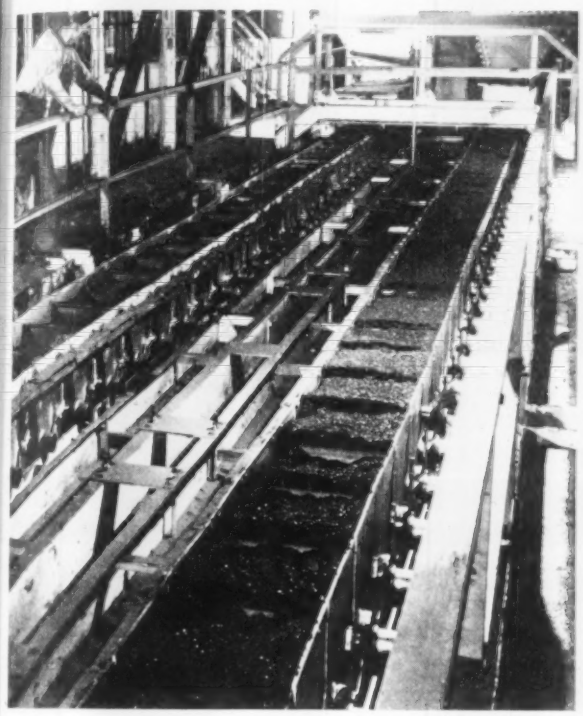
No Delay In Dumping Cycle—Mechanical handling of locally mined coal starts at the Price mine headhouse high on the mountainside, with a mine car-feeder ahead of a two-car rotary dump. This feeder is designed to handle a trip of 75 loaded 3-ton capacity mine cars, of which not more than 20 will contain mine rock. As the cars are advanced by the dump operator, they are weighed by a track scale and then dumped two at a time without uncoupling. Motor-operated gates under the dumper enable the load to be dumped directly either to the coal hopper or rock hopper without regard to the position of the car in the trip, and without delay in the dumping cycle.

Mine rock delivered from mine cars or hand-picked from the lump coal is fed by a reciprocating feeder from the rock dump hopper to a belt conveyor which discharges it to a crusher for reduction to about minus 6 inches. Belt conveyors lower the crushed rock down the mountainside to the valley, where the preparation plant is located, then across the valley

where rejects from the coal washery join it, and up the opposite mountainside to a bin for disposal in a gob pile by truck or bulldozer. A large bin is provided at the preparation plant to permit all rock and refuse to be diverted to it in an emergency.

Mine rock can be handled at a normal uniform rate of 125 tons per hour, or up to 250 tons per hour for short periods when an abnormal amount is encountered in a single trip of cars from the mine.

Run-of-mine coal, after being rotary-dumped into the coal hopper, passes by a reciprocating feeder to a belt conveyor, which carries it to a combination screen and picking table and belt conveyor. Large rock is here hand-picked from the coal while it is being carried down the mountainside to the run-of-mine shaker screens in the coal preparation building. Here all of the run-of-mine coal is separated into plus 5-inch (lump) and minus 5-inch sizes.



Fine coal from the blending bin is not treated in the air-pulsated coal washers, but goes instead to a surge bin, seen in right background, from which it is automatically distributed by this Sidekar Karrier in uniform quantities to 18 concentrating tables directly below this area. Thus it is possible to shut down any number of concentrating tables without interfering with automatic delivery of a controlled supply to the rest

Coal received from other mines by rail or truck, so-called "foreign" coal, is discharged into a dump hopper equipped with a reciprocating feeder which delivers to a belt conveyor for discharge to the run-of-mine shaker screens. A Link-Belt car shaker facilitates the unloading of rail cars.

Down-The-Chute for Waste Rock — Lump coal (plus 5-inch) next passes from the sizing screens over a lump picking table where final picking removes objectionable material containing reclaimable coal, together with small rock that was not removed with the large rock. Rock hand-picked from the coal is delivered by chute to the rock crusher. The pickings removed for reclamation are crushed and feed back into the minus 5-inch coal coming from the run-of-mine shaker screen.

Run-of-mine minus 5-inch coal belt is equipped with a magnetic head pulley for automatic removal of tramp iron.

The picked lump coal may be delivered directly to rail cars by a car loading boom equipped with a hinged end to permit gentle laying in the car. An automatic car changing chute permits cars to be changed without interrupting coal flow.

A portion of the lump coal may be diverted and crushed. The crushed product is delivered to a mixer where it joins the natural 2-inch slack for loading into railroad cars.

Minus 5-inch coal is carried from the run-of-mine shaker screen to a five compartment blending bin. It is evenly distributed over bin's entire length by means of a motor propelled automatic-reversing steel tank-type tripper equipped with a two-way discharge chute. Automatic controls signal the operator when the bin is filled to capacity, or when the coal has reached its lowest operating level. The arrangement is such that a uniform layer loading of the blending bin is maintained at all times.

Raw minus 5-inch coal is fed uniformly from the five compartments of the blending bin by means of five belt feeders to five vibrating screens. P.I.V. variable speed drives on the belt feeders permit regulation of the rate of feed from the blending bins.

On the vibrating screens the coal is separated into 5 x $\frac{3}{8}$-inch and $\frac{3}{8}$ x 0-inch fractions.

Water Currents Utilized—The 5 x $\frac{3}{8}$-inch coal is delivered by belt conveyor to a shaking chute which delivers equal portions to each of two Link-Belt air-pulsated wash boxes in which the stream of raw coal passes over a perforated plate and is subjected to the action of periodic upward and downward currents of water. This action causes stratification of both the coal and impurities according to their respective specific gravities. Low specific gravity (lighter) clean coal concentrates in the upper strata of the bed, while the heavier impurities—clay, rock, slate, etc., with their higher specific gravity and faster settling rate—accumulate in the lower strata. Upward current of the water raises the coal over the weir while the impurities are trapped.

Primary refuse from the two wash boxes is carried by the refuse conveyor system or to the refuse bins. Secondary refuse is rescreened at about 2 inches. The undersize is carried away for disposal, while oversize is crushed and delivered to the blending bin with the 5 x 0-inch coal. Fines are washed through the screen to the bottom where an endless screw carries them off.

Possible to By-Pass Crusher—Washed and cleaned coal from the wash boxes is sluiced with the wash water to the washed coal screens, on which it is sep-

arated into four sizes: 5 x 2-inch, 2 x 1¼-inch, 1¼ x ⅜-inch, and minus ⅜-inch. The 5 x 2-inch coal may be delivered directly from the washed coal screens to the adjustable-end hinged loading boom to be laid gently into railroad cars for shipment. A portion or all of it, however, may be diverted by apron conveyor to a crusher, from where it is delivered to a paddle mixer in which it joins the natural 2-inch slack for loading into cars. It is possible, also, to by-pass the crusher and deliver 5 x 2-inch egg to a domestic bin.

The 2 x 1¼-inch washed coal is delivered to the slack belt for transfer to the paddle mixer and thence to cars.

The 1¼ x ⅜-inch stoker coal may be delivered from the washed coal screens to a secondary dewatering screen for additional dewatering and discharge to a reversible belt conveyor for delivery to the car loading boom. However, it may be diverted to the slack belt for delivery to the paddle mixer and thence into cars.

The minus ⅜-inch coal which passes through the washed coal screens is pumped in its wash water to a settling cone. Settled solids are pumped from the settling cone to join the effluent from the concentrating tables before they are delivered to the centrifugal filters.

Cleaning coarse coal is not a particular problem, and is effectively handled as outlined above. Present mining methods produce such a large percentage of minus ⅜-inch coal, however, that its treatment presents a major problem. The installation at Price represents an outstanding and thorough engineering solution.

Minus ⅜-inch coal which is received from the five vibrating screens at the blending bins is collected by belt conveyor and delivered into a surge bin. From the bin the coal feeds into a Sidekar-Karrier which distributes it to 18 hoppers at a constant rate to 18 Deister diagonal deck washing tables for the cleaning process.

Clean coal from the washing, or concentrating, tables is then collected in sluices and delivered to five Bird centrifugal filters for dewatering. These dryers are built around a horizontal shaft and consist of two rotating elements. The outer is a solid bowl shaped like a truncated cone. This rotates at 650 rpm and develops a force many times that of gravity.

Inside this solid bowl, and turning at a slightly different speed, is a helical conveyor. The centrifugal force developed compels even the finest solids to settle. They are picked up by the conveyor and discharged through the small end of the bowl; the water discharges through the large end of the bowl head.

The resultant coal, which falls well within the required moisture limits, is conveyed by belt conveyors to the slack belt for transfer to the paddle mixer and subsequent loading into cars.

Refuse from the concentrating tables is dewatered in a centrifugal filter and then conveyed away by the refuse belt for disposal together with the wash box refuse.

Statistical Quality Control

(*Continued from Page 62*)

can't be measured so closely, but precision in measurement is gained by taking averages of many. From data it can be determined that if averages of five measurements are held within their control limits, individual measurements will all fall between 0.0030-inch and a theoretical 0.0061-inch.

Located at the machine, the chart indicates that for the first four days the operator played favorite to the top limit because he was not using the chart to "steer" the process. During this time, there were considerable defectives with too much backlash being made. After the operator began to use the chart, he got the job centered correctly and made very few defectives.

The range chart indicates what the machine can hold. Its control limits are calculated from the data.

The out of control point on 11/23 was caused by an improperly ground cutter which had just been put into the machine. As a result of the chart the bad cutter was removed. Without the chart the cutter would have been used and the best operator in the world would not have been able to make all good parts. Some time would have probably elapsed before anyone would have known that the trouble existed and by the time it was discovered much scrap would probably have been made. Operator would have been blamed for something that wasn't his fault.

Because they head-off trouble in this manner, it has been said that "control charts detect trouble before it occurs."

Fig. 4 illustrates how to use a "p" chart (per cent defective chart) to compare quality from each of five assembly lines. It shows that the potential quality level from each line is 0.3 per cent defective. It shows further that lines No. 1, 5 and 6 were doing good work and that lines No. 3 and 4 were doing significantly worse quality work.

Fig. 4 is a copy of an actual chart resulting from an early study on flexible shaft assemblies. Interpretation of this chart is obvious. Most are not so obvious, but require a little study. Position of the control limits and center line is calculated from information provided by original data.

A 50 Per Cent Cut—By concentrating corrective action on machines, men and materials associated with lines 3 and 4, the total per cent defective for the department was cut from over 1 to less than ½ per cent as these erratic lines improved to the level of the good lines.

Besides control charts for averages and ranges of small samples, another type of "p" control chart is also very useful, inasmuch as it is especially effective when used as a guide for the application of administration "pressures."

The "p" chart shown in Fig. 6 is simply a per cent defective or proportion defective chart, with upper and lower control (or action) limits drawn in. A center line is also helpful, as with all control charts, and is also usually drawn in.

Aside from their administration use, the "p" charts

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are valuable for machine control, when the measurements taken are of the "attributes"-type because in such cases, chart for average and range cannot be used. Chart A shown in Fig. 6 is such a machine control chart. Data was taken from the end of the line, some days later, after many other operations had been added, some of which affected the item being checked. Even though the chart was far removed from the machine, its use led to process improvement.

The early part of chart A shows all plotted points within the control limits, which are based on a previous experience of 0.10 per cent defective. This means the process is running steady at 0.10 per cent defective, even though samples fluctuate (none of the sampling fluctuations are significant). However, on 1-19 point No. 1 was plotted which was outside the upper control limit. This signified an unexpected event and called for a thorough investigation. The source of trouble was located, a machine improvement installed and production continued.

The Human Element—By 1-31 it should be noted, 8 consecutive points were located below the extended center line of 0.10 per cent. To obtain 8 consecutive points below the center line is as improbable as to toss 8 consecutive "heads" with a coin; it would be expected to happen on the average, once out of every 256 trials of 8 tosses each. By 1-31 therefore, it was known that the new process was significantly better than the old one. That called for more data to indicate the new process level which turned out to be about 0.05 per cent defective, and so new control limits were drawn in. The process then ran in control until point No. 2 on 2-9. An investigation at that time indicated that the die setter had been moved to different machines and the new die setter didn't know about "gadgets" which had been added to the machine or how to care for them. After he was informed the process again ran fine. Out of control point No. 3 is related to point No. 2. The material was already in process at the time point No. 2 was obtained.

There you have it: An actual case where a "p" chart from a little bit of data that was given late from a distant control point was still able to correct an out-of-control process.

Control chart limits are often based on averages of measurements rather than on the measurements themselves.

Why Use Averages—The reason for using averages is simple: They do not fluctuate as much as measurements do. Every group of four measurements has a high and a low that tend to average toward the middle, and a second high and second low that also tend to average toward the middle. The average of the two averages tends to average down toward the middle even more. So charts based on averages (see Fig. 8) are much more efficient in detecting a shift in level, such as might occur because of tool wear, than charts based on original measurements themselves.

The "equivalent tolerances" shown in Fig. 8 are our familiar control limits. They apply to averages of four measurements. If the measurement spread gets wider, but the average does not shift up or down, these control limits for averages probably would not detect the change, but in such a case the range chart would detect it.

A frequency distribution such as shown in Fig. 7 is a very handy tool. Each tally represents one measurement for gear thickness on one unit and is practically no work to accumulate on a chart like this if 10 or 20 measurements are tallied from each lot.

The sequence here is . . . . 7—grinding of sides, 8—heat treating, and 9—final inspection. This data came from final inspection and shows that about 15 per cent of the gears are too thick, and that the distribution centers about 0.0005-inch too high. Similar data before hardening indicated that most of the gears were within tolerance. Interpretation is that those gears grow an average of 0.0005-inch during hardening. Grinding the gears thinner by 0.0005-inch on the average, provided the solution.

Although this action resulted in pulling the high end of the distribution down into the specification tolerance, it did not throw many more out in the low side, because most of those defectives were not caused by grinding, but were already too thin before they got to grinding.

Portions of the above material were presented before the Chicago section of the American Management Association, Dec. 12, 1950. Operational data were prepared exclusively for STEEL.

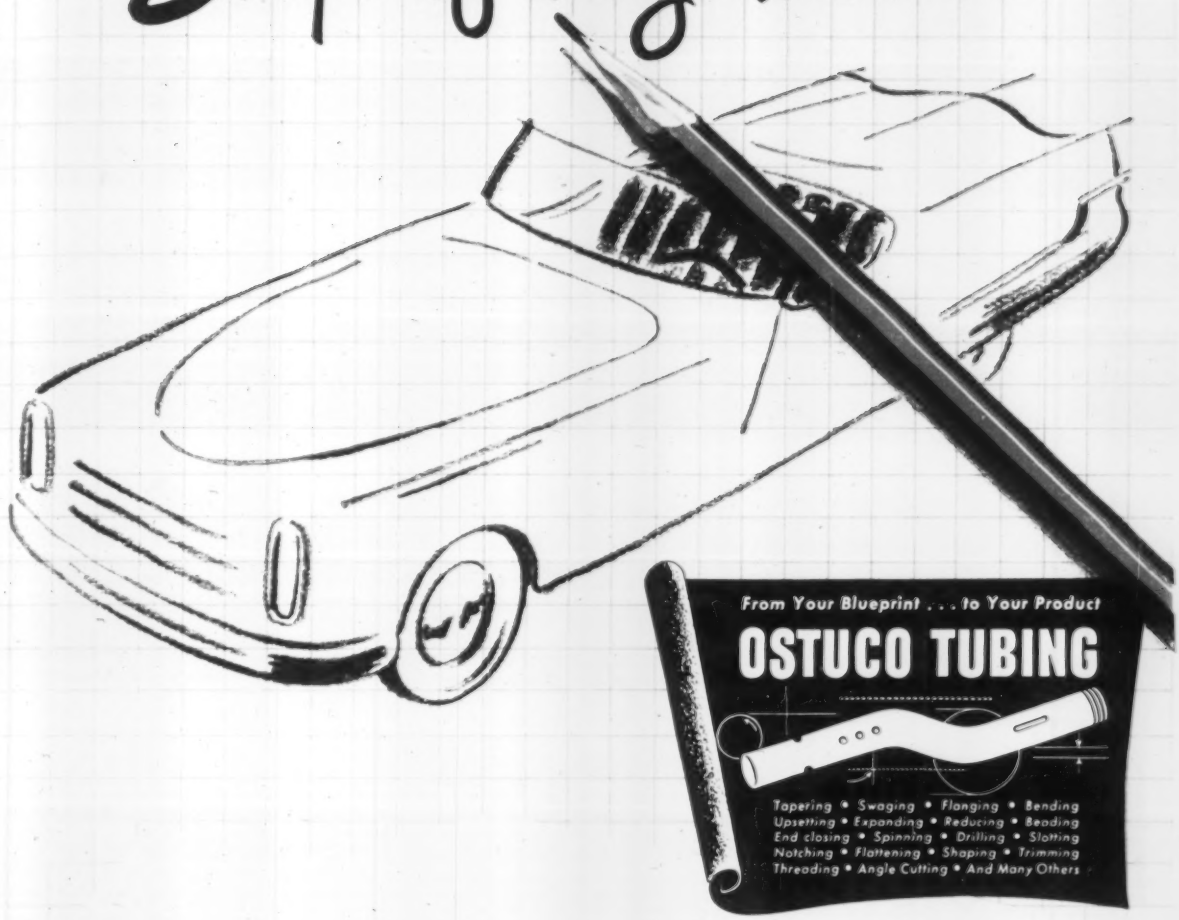
Automatic Soldering Costs Lowered

AIRCRAFT PARTS production up to 125 pieces per hour is possible with a two-man crew on the automatic soldering setup developed by Automatic Soldering Methods Inc., Newark, N. J. Eight to 12 pieces are held along the periphery of the 8-foot revolving table. One set of burners travels with the table and preheats the parts and another stationary set provides the final fusion heat. A single Leiman air pump provides air for several tables at 5 to 10 psi. The air is mixed with city gas to bring flame temperature up to 1300 F

Catalog Charts Detail Torches

An illustrated 26-page catalog published by Air Reduction Sales Co., New York, contains detailed information on its line of welding and cutting torches, outfits, tips and accessories. Charts show correlation of tip, mixer, extension and torch, containing complete data for each component part. Cutaway views of both welding and cutting torches are shown.

Shape of things to come...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Threading • Angle Cutting • And Many Others

Whether your products are automotive or in some entirely different field, you doubtless are doing some long-range planning . . . looking beyond the immediate future to the time when increasing production for civilian use will again demand emphasis on advanced design.

In exploring the possibilities for the future, it will pay you to consider the many advantages of OSTUCO Steel Tubing. Hundreds of product engineers and manufacturers have found that no other material offers so many outstanding opportunities for improving design, increasing strength, reducing weight, enhancing beauty, and cutting cost.

Because of the growing needs of our armed forces, we cannot promise early delivery on new civilian orders, but we do wish to help you take advantage of OSTUCO Tubing in your plans for the future. Please feel free to call on our experienced tubing engineers for advice and information at any time.

THE OHIO SEAMLESS TUBE COMPANY

Manufacturers and Fabricators of Seamless and Electric Welded Steel Tubing

Plant and General Offices: SHELBY 4, OHIO

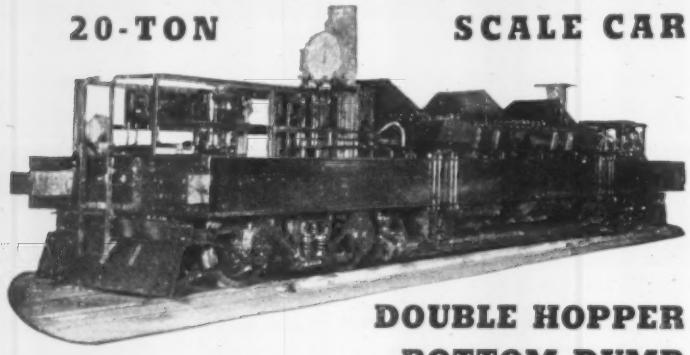
SALES OFFICES: BIRMINGHAM, P. O. Box 2021 • CHICAGO, Civic Opera Bldg., 20 N. Wacker Dr. • CLEVELAND, 1328 Citizens Bldg. • DAYTON, 511 Salem Ave. • DETROIT, 520 W. Eight Mile Road, Ferndale • HOUSTON, 6833 Avenue W, Central Park • LOS ANGELES, Suite 300-170 So. Beverly Drive, Beverly Hills • MOLINE, 617 15th St. • NEW YORK, 70 East 45th St. • PHILADELPHIA, 1613 Packard Bldg., 15th & Chestnut • PITTSBURGH, 1206 Pinewood Drive • ST. LOUIS, 1230 North Main St. • SEATTLE, 3104 Smith Tower • SYRACUSE, 501 Roberts Ave. • TULSA, 733 Kennedy Bldg. • WICHITA, 622 E. Third St. • **CANADIAN REPRESENTATIVE:** RAILWAY & POWER CORP., LTD.

ATLAS

Scale Cars

DESIGNED AND ENGINEERED FOR YOUR SPECIFIC NEEDS

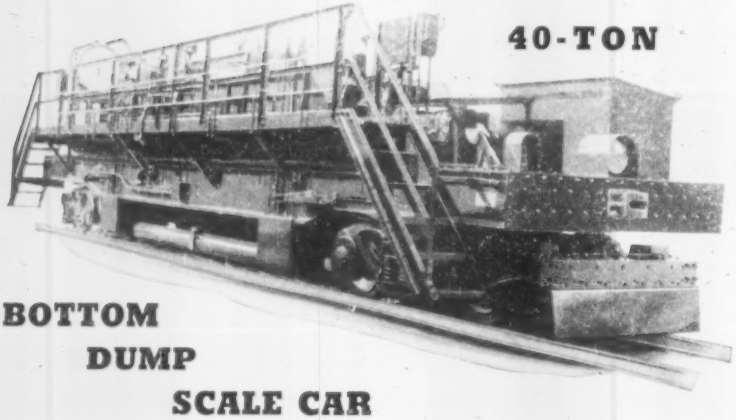
20-TON SCALE CAR



DOUBLE HOPPER BOTTOM DUMP

Car has Atlas underslung suspension scales with Atlas 24" scale Dial with chart recording. Air brakes and air-operated discharge gates. Cast steel side-frame trucks with Roller Bearings.

40-TON



BOTTOM DUMP SCALE CAR

Car has anti-friction bearings throughout, including axle mountings. Car has foot operated "Dead Man" control feature with air brakes inter-locked to apply automatically. Provided with ATLAS all-steel scales and 30" indicating dial. Type printing recorder attachment provides automatic weight registration at skip pit. All standard safety features provided including red marker lights and lights for illuminating the front of the bin.

Atlas Engineering Service is always at your service

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

New Books

Engineers' Handbooks

Kent's Mechanical Engineers' Handbooks, Volumes 1 and 2; fabricoid, approximately 3000 pages, 5¾ x 8½ inches; published by John Wiley & Sons Inc., New York, for $8.50 per volume; available from STEEL, Penton Building, Cleveland 13, O.

Each of the two volumes is written by a large staff of experts in clear and accurate language. Covered are the developments in mechanical engineering made since the eleventh edition was published in 1946. Volume 1, design and production, is edited by Colin Carmichael, editor of *Machine Design*, while volume two, power, was prepared by J. K. Salisbury, division engineer, Thermal Power Systems Division, General Electric Co.

Handbook stresses practice rather than theory. Although much of the material from the eleventh edition has been condensed, both volumes are now larger than their predecessors in order to present the most recent data and the latest practice. An extremely detailed index makes each piece of information easily accessible. One hundred and sixty-eight specialists have contributed to the handbooks. Data presented consists essentially of basic principles, working formulas, charts, and tables, standard dimensions, proportions, specifications and illustrated discussions of typical equipment.

Metal Selection

Materials Engineering of Metal Products, by Norman E. Woldman, consulting metallurgical engineer and faculty member, Cooper Union School of Engineering and Stevens Institute of Technology Graduate School; cloth, 583 pages, 6¼ x 9¼ inches; published by Reinhold Publishing Corp., New York, for $10.00; available from STEEL, Penton Building, Cleveland 13, O.

To help the materials engineer select type of metal or alloy best able to meet a given set of service conditions is the purpose of this book. It presents the material used in various types of industries and different applications in an attempt to correlate their metallurgy with engineering design and service application. The book is pointed to meet the needs of engineering students, professional engineers and production engineers.

Text is clearly and simply written with discussions on advantages and disadvantages of the various types of metals and alloys and specific serv-

QUALITY
ALL THE WAY THROUGH

WEIRITE — HOT-DIP AND ELECTROLYTIC TIN PLATE, TIN MILL BLACK PLATE

WEIRZIN — ELECTROLYTIC ZINC-COATED SHEETS AND STRIP

WEIRTON — HIGH-CARBON STRIP, COLD-ROLLED SPRING STEEL

WEIRALEAD — LEAD ALLOY COATED SHEETS AND LONG TERNE SHEETS

WEIRCOLOY — GALVANIZED SHEETS

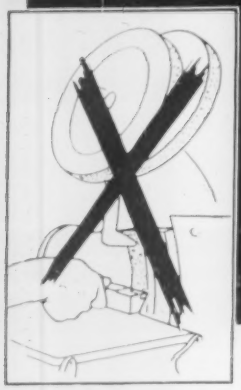
N-A-X — HIGH-TENSILE LOW-ALLOY STEELS

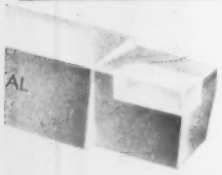
Lacquered and Coated Products • Tie Plates • Structurals • Bars • Piling
Hot-Rolled Sheets and Strip • Cold-Rolled Sheets and Strip • Angles

WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION

How to CONSERVE Grinding Wheels and Operator Time

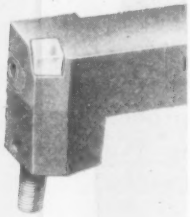




Conservation of materials and manpower, always essential, becomes imperative in times of emergency. Marked savings in equipment and labor required for maintenance operations are readily effected by using metal-cutting tools that stay sharp longer. The full significance of this obvious fact is perhaps not fully realized.

Kennametal tools, for example, work more hours per day, spend less time in the grinding room, and thus help sustain machine productivity, make operators more efficient, and reduce inventory. On important jobs they have demonstrated an ability to do up to four times as much machining per unit of carbide consumed.

This superior performance results from a unique coordination of manufacture and an all-inclusive control of properties—from raw materials to finished product.

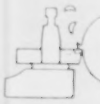


Kennametal Inc., in its own plant, refines all carbides directly from ores, oxides, and by-products; processes these carbides into Kennametal compositions by means of exclusive methods and patented techniques; and fabricates complete tool and wear-part designs that utilize the distinctively uniform combination of hardness, strength, and wearability inherent in Kennametal. Outstanding among these efficient application developments is the mechanically-held technique, in which we pioneered.

A sure means to prevent waste of man-hours and equipment, therefore, is Kennametal tooling.

For those who wish assistance in developing tool applications that provide maximum cost-saving and productivity through utilizing the unique properties inherent in Kennametal, the Company maintains a corps of competent Field Engineers in all important industrial centers.

Their services are available to you for the asking.



KENNAMETAL® *Inc.*, Latrobe, Pa.

MANUFACTURERS OF SUPERIOR CEMENTED CARBIDES AND CUTTING TOOLS THAT INCREASE PRODUCTIVITY

ice application. Numerous tables of data on the physical properties in the form of statistics, together with many illustrations showing various types of metal failures, equipment being used, etc., are incorporated.

Book is divided into five main sections: Materials for lightweight construction, such as aluminum alloys, magnesium alloys, high strength low alloy steels, and stainless steel; materials for mechanical products such as gears, springs, bearings and threaded fasteners; materials for electrical industries such as magnetic materials, electrical contacts, thermostat metals and electrical resistance alloys; materials for special and severe service such as corrosion resistant materials and high temperature alloys; testing of materials such as mechanical and nondestructive testing. An appendix of tabulated properties and characteristics of materials is included.

Metal Properties

Properties of Metals At Elevated Temperatures, by George V. Smith, research laboratory, United States Steel Corp.; fabricoid, 401 pages, 6¼ x 9¼ inches; published by McGraw Hill Book Co. Inc., New York, for $7.00; available from STEEL, Penton Building, Cleveland 13, O.

The initial chapters are of a fundamental character, dealing with the nature of plastic deformation and fracture of metals from a metallurgical point of view, first at ordinary temperature and then at elevated temperatures. Test apparatus and procedures employed in evaluating metals for service at elevated temperatures are then described. Ensuing chapters summarize available knowledge on the effects of such invariables as chemical composition, manufacturing practice and heat treatment.

Separate chapter is devoted to the question of scaling of metals and to the nature of the changes in microstructure which may be expected to occur during service. Problem of design for service at elevated temperatures, particularly with the choice of working stress, is covered in the final chapter. The appendix provides information on the so-called super-alloys of recent and current interest.

Aim of the book is to present a comprehensive summary of available knowledge on the effect of temperature on the properties of metals. At the same time it should prove useful to the student just encountering the field and the graduate metallurgist or engineer actually engaged in the development, evaluation and application of metals for service at elevated temperatures.

CALENDAR
OF MEETINGS

† denotes first listing in this column.

Jan. 24-Feb. 1, Associated Equipment Distributors: 32nd annual meeting, Stevens Hotel, Chicago. AED address: 360 N. Michigan Ave., Chicago 1.

Jan. 29-Feb. 1, Institute of Aeronautical Sciences: Annual meeting, Hotel Astor, New York. Institute address: 2 E. 64th St., New York 21.

Feb. 1-2, Society for Advancement of Management: Annual spring management conference. Sponsored jointly with Northwestern University centennial committee, Chicago chapter, SAM, address: 53 W. Jackson Blvd., Chicago 4.

Feb. 7, Bituminous Coal Research Inc.: Annual meeting, Deshler-Wallick Hotel, Columbus, O. BCR address: Southern Bldg., Washington 5.

Feb. 8, American Coke & Coal Chemicals Institute: Regional meeting, Congress Hotel, Chicago. Institute address: 711 14th St., N.W., Washington 5, D. C.

Feb. 9, National Welding Supply Association: Western zone meeting, Hotel St. Francis, San Francisco. Association address: 505 Arch St., Philadelphia 6.

Feb. 14, Steel Kitchen Cabinet Institute: Annual meeting, Hotel Cleveland, Cleveland. Institute address: Engineers Bldg., Cleveland 14.

Feb. 16, Eastern States Blast Furnace Association: Meeting, William Penn Hotel, Pittsburgh.

†**Feb. 16-23, Automotive Electric Association:** Meeting, Edgewater Beach Hotel, Chicago. Association address: 802 Michigan Blvd., Detroit 26.

†**Feb. 19-22, American Institute of Mining and Metallurgical Engineers:** Annual meeting, Jefferson Hotel, St. Louis. Institute address: 29 W. 39th St., New York.

†**Mar. 5-7, Hydraulic Institute:** Quarterly meeting, Santa Barbara Biltmore Hotel, Santa Barbara, Calif. Institute address: 122 E. 42nd St., New York.

†**Mar. 5-9, American Society for Testing Materials:** Spring meeting, Cincinnati. Society address: 1916 Race St., Philadelphia.

†**Mar. 6-8, Society of Automotive Engineers:** Passenger car, body and materials meetings, Hotel Book Cadillac, Detroit. Society address: 29 W. 39th St., New York.

†**Mar. 12-15, National Electrical Manufacturers Association:** Meeting, Edgewater Beach Hotel, Chicago. Association address: 155 E. 44th St., New York 17.

†**Mar. 13-16, National Association of Corrosion Engineers:** Conference and exhibition, Statler Hotel, New York. Conference committee address: P. O. Box 6120, Philadelphia 15.

†**Mar. 15-17, American Society of Tool Engineers:** Annual meeting, Hotel New Yorker, New York. Society address: 1666 Penobscot Bldg., Detroit 26.

†**Mar. 18-23, Pressed Metal Institute:** Spring meeting and technical session, Hotel Carter, Cleveland. Institute address: 13210 Shaker Square, Cleveland 20.

Movie of Electrical Testing

In 26 minutes, a sound color motion picture tells of testing switch gear and other electrical equipment at full power and voltage in the high power laboratory of Westinghouse Electric Corp., East Pittsburgh, Pa. Entitled "Electrical Proving Ground," the movie includes scenes showing the tremendous concentration of over 3 million kva available for testing the largest equipment.

fire safety earns Insurance Savings

for world's largest airline shops!

A leading factor in the business economy of Pan American World Airways is evidenced in the extensive system of fire protection which was recently installed at the Company's huge Miami, Florida Overhaul Base. At this multi-million dollar facility, all classifications of aircraft, including giant Clippers costing as much as $1,500,000 each, undergo complete servicing and minute inspection. The entire operation is safeguarded from fire by means of Automatic Sprinkler systems, scientifically designed for the special hazard of airplane storage and repair. Over 15,000 fixed temperature and Rate-of-heat-Rise operated sprinklers are ready at all times to provide instant, effective protection at the first indication of flame.

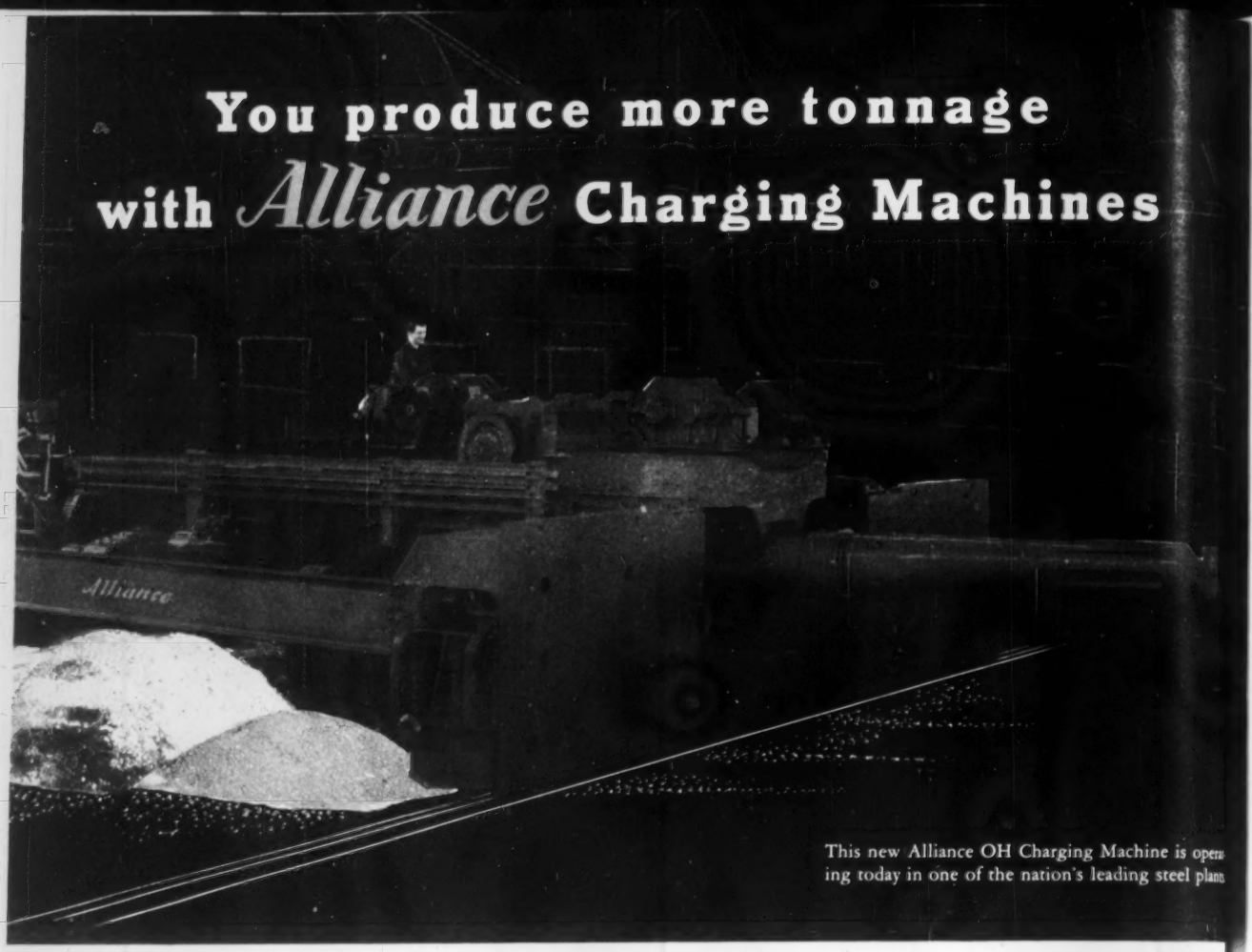
Adequate fire protection is essential for Pan American and it should be for you. It provides absolute security through preserving the continuity of business operations and, in so doing, offers additional advantages in the form of reduced fire insurance rates.

Better call on your nearest Automatic Sprinkler representative for complete information on how you too can save lives . . . save property and save money with Automatic Sprinklers.

"AUTOMATIC" SPRINKLER CORPORATION OF AMERICA
YOUNGSTOWN 1, OHIO

"Automatic" Sprinkler
FOR INVESTMENT PROTECTION
DEVELOPMENT . ENGINEERING . MANUFACTURE . INSTALLATION
OFFICES IN PRINCIPAL CITIES OF NORTH AND SOUTH AMERICA

You produce more tonnage with *Alliance* Charging Machines



This new Alliance OH Charging Machine is opera ing today in one of the nation's leading steel plant

EXCLUSIVE WITH ALLIANCE Our new 12-ton low-type open hearth Charging Machine has spring-loaded pitman so, if the charging box pushes up on scrap in furnace, the trolley's front wheels won't lift off rails. Trolley always has sufficient tractive power to retract the peel and box from furnace. The spring-loaded pitman also prevents shock when peel is lowered to engage charging box.

EXCLUSIVE WITH ALLIANCE Bridge girders of Alliance's new Charging Machine consist of two wide, flanged I-beams welded to form a box section. Between webs of this box section diaphragms are welded at intervals of 3 ft., plus other welded reinforcements.

EXCLUSIVE WITH ALLIANCE Machinery deck plate extending full length of bridge between main girder and outrigger girder reinforces main girder laterally and keeps Charging Machine square under all operating conditions.

EXCLUSIVE WITH ALLIANCE Stabilized, shock-absorbing wheels operate at rear end of trolley. Two of these wheels engage the lower rail; two adjacent wheels engage the upper rail. Wheels are held in contact with respective rails by means of springs. When load is engaged and disengaged at end of the peel, shock which normally occurs at end of trolley is absorbed by the spring suspension. Consequently, shock to the operator is minimized.

EXCLUSIVE WITH ALLIANCE On eight-wheel bridges, the four trucks located at corners of the bridge are equalized to accommodate any irregularities in the track.

EXCLUSIVE WITH ALLIANCE The new hydraulic lock rod gives operator finger-tip control and eliminates laborious work ordinarily connected with lock rod operation.

EXCLUSIVE WITH ALLIANCE All gears (including track wheel gears) are fully enclosed and run in oil.

This Charging Machine was built by the world's largest builders of the world's largest cranes. Alliance leads the field with its heavy material-handling equipment. Contact Alliance for your requirements.

THE ALLIANCE MACHINE COMPANY

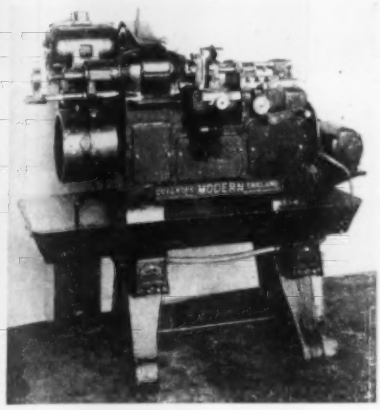
MAIN OFFICE
ALLIANCE, OHIO • PITTSBURGH OFFICE
1622 OLIVER BUILDING, PITTSBURGH, PA.

LADLE CRANES • GANTRY CRANES • FORGING MANIPULATORS • SOAKING PIT CRANES • STRIPPER CRANES • SLAB AND BILLET CHARGING MACHINES • OPEN HEARTH CHARGING MACHINES • SPECIAL MILL MACHINERY • STRUCTURAL FABRICATION

New Products and Equipment

Quick Screw Machine Setup

Screw machines in two sizes, one having ⅞-inch bar capacity and one having 1½-inch bar capacity are available from DCMT Sales Corp., 154 Duane St., New York 13, N. Y. The ⅞-inch unit has standard 2-hp motor, giving 8 spindle speeds from 810 to 2500 rpm. Headstock spindle is



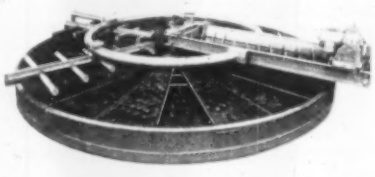
mounted in two taper roller bearings. Each machine is capable of producing three operations with extremely simplified tooling and cams.

Camshaft is driven by a separate ½-hp motor, the control gear of which is interlocked so that it cannot be started before the headstock motor. It also shuts down immediately when the 2-hp motor stops. Nineteen rates of feed are provided, giving cycle minute times of 0.084 to 1.81 or from 12 pieces per minute to one piece in 2 minutes.

Check No. 1 on Reply Card for more Details

Foundry Sand Washer

Filtering operations involving the washing and dewatering of coarse solids contaminated with fine waste material, organic or inorganic, are readily performed with the horizontal



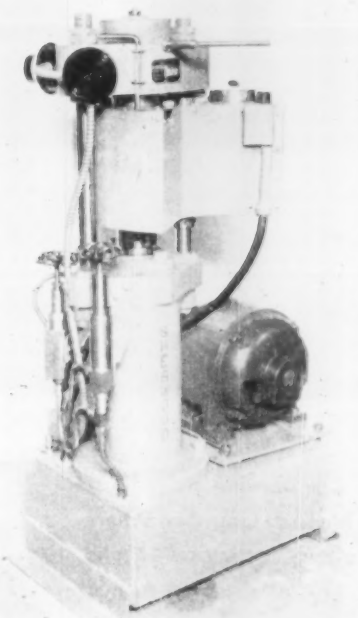
rotary filter made by Oliver United Filters Inc., 260 California St., San Francisco 11, Calif. Unit is particularly well suited to washing foundry sands which must be free of organic material. Cake usually is discharged with moisture content ranging from 6 to 8 per cent.

It is available in sizes ranging from 10 to 165 sq ft of filter area and from 4 to 15 feet in diameter. Filter unit is made in steel, stainless steel and lead protected.

Check No. 2 on Reply Card for more Details

Improved Wax Injection

Sherwood Metal Products Co., through its agent, Alexander Saunders & Co., 95 Bedford St., New York 14, N. Y. is producing an improved model WP12 wax injection press. It is designed for the production of wax and plastic patterns for precision investment casting. Pattern



material is heated by oil circulating only through the revolving drum and crosshead. Thermostatically controlled temperatures to 400° F may be attained without overheating hydraulic ram mechanism.

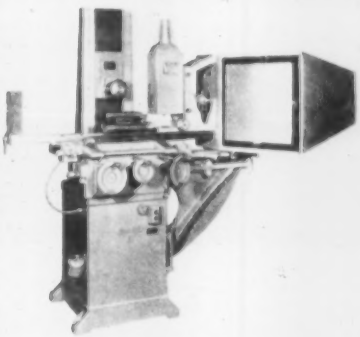
Ram pressure, varying with the power of the motor installed, to 1500 psi may be developed. The revolving drum holds four wax cylinders. Each cylinder is 3½ inches in diameter with an effective length of 7 inches, capacity being about 67 cubic inches. Total capacity for the press is about 268 cubic inches.

Check No. 3 on Reply Card for more Details

Contour Grinder Refined

Improvements in design and construction have been incorporated in the Visual Grind, contour grinding machine made by Ceveland Grinding Machine Co., 6514 St. Clair Ave., Cleveland 3, O. These changes result in increased rigidity and greater precision.

Support for the entire optical projection system is now a heavy aluminum alloy casting. Improvements in the optical system are: Fins in lamp housing to increase radiation and dispersion of heat to prolong lamp life; lamp housing adjustment by hand wheel, worm gear and screw, rising and falling on dovetail ways; and



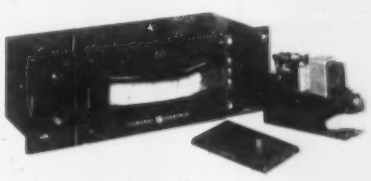
preset lens tube to insure positive focus.

Longitudinal and cross traverse movement of the optical system is on hardened steel ways and rollers, making adjustment easier and completely counterbalancing the entire optical system. Variable powered longitudinal feed of the table relieves the operator of hand feeding during the rough and finish grind phases.

Check No. 4 on Reply Card for more Details

Close Temperature Control

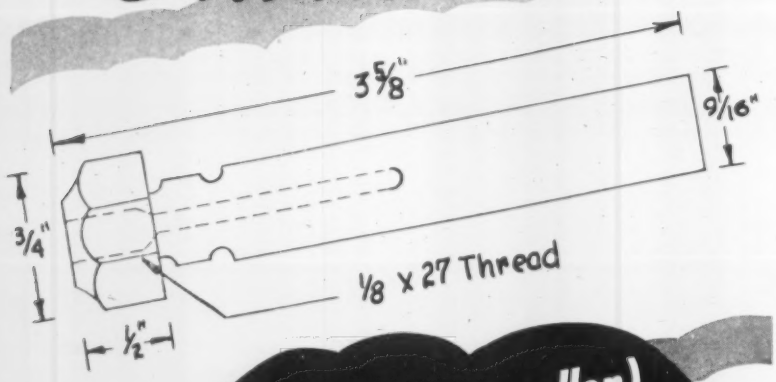
Pyrometer equipment, offering accurate temperature indication, close temperature control of industrial processes and protection for furnaces, ovens and kilns is announced by General Electric Co., Schenectady 5, N. Y. The instrument has a calibrated accuracy within ¾ of 1 per cent of full



scale. A legible 7-inch scale, fitted with an antiglare cover, indicates any change in temperature equivalent to 1/10 of 1 per cent of full scale.

A 3¼-pound magnet provides higher flux density and allows larger air gaps than are found in conventional

How to trade Pennies for Dollars . . .



10c more (per gallon) invested in cutting fluids SAVES $50 PER DAY PER MACHINE!

PRICE alone makes no profit. The drawing above illustrates a shackle bolt which is drilled and tapped on a New Britain Automatic. Using an inferior cutting oil 12 taps were used up every 2½ days—12 pieces per tap. A change to Stuart's SPEEDKUT M on a 2½ day run showed 530 pieces per tap—no taps used up. The saving? Taking into full account the pennies-higher price of Stuart *quality* oil: $50 per day per machine!

If you are interested in a saving like this, ask to have a Stuart representative call. There is no obligation—we'll let Stuart performance do the selling.

STUART QUALITY pays you DIVIDENDS

Write for latest literature

D.A. Stuart Oil Co.

2735-37 S. Troy St., Chicago 23, Ill.

instruments. Foreign matter will not impair the operation of the instrument since the indicator is so sealed that it can be installed in humid or dirty locations. The type HP-3 controller provides on-off action of the final control element by either a relay, mercury switch or a contactor through which electric power is supplied to the furnace or oven. The pyrometer protector, a separate form of the HP-3, is usually used in conjunction with and to protect against the possible failure of a separate precision controller.

Check No. 5 on Reply Card for more Details

Small Load Handler

A complete hoisting unit with reversing motor, trolley, cable and double hooks is being made by Flinchbaugh Co., York, Pa. It is intended for handling long items in quantity, barrels or drums, castings and loose material such as small parts, chips, waste, in any size tub.

Hoist lifts 500 pounds at 25 fpm or 250 pounds at 50 fpm. The hooks

are regularly spaced 48 inches apart but can be adjusted for lesser distances or the unit can be furnished with hooks to any distance apart. It is supplied with swivel and adjustable trolley wheels to fit any size or make of track and will travel any size curve. Speed changes from 54 to 500 rpm are possible by changing pulley sizes.

Check No. 6 on Reply Card for more Details

Scrap Separated Magnetically

Automatic separation of magnetic and nonmagnetic products is accomplished with a nonelectric permanent Alnico double drum magnetic separator made by Dings Magnetic Separator Co., 4740 W. Electric Ave., Milwaukee 46, Wis. Unit is well suited for processing nonferrous chips and

Sixty million is a lot of anything and that is the number of items Townsend can produce in one working day. Lately it just isn't enough to go around. We have strained every facility and every source of raw material to keep our production above average—but we still can't keep ahead of our orders.

So, if our delivery date for large and small cold-headed solid rivets and tubular rivets, special nails, fasteners, parts and other gadgets is longer than usual, please bear with us.

We believe our backlog of orders is in some measure caused by the savings we have created for our customers—so we intend to keep quality up to our rigid standards, no matter how busy we get.

Even if you must wait for delivery—you can count on Townsend quality control which has back of it 135 years of experience in wire drawing and cold-heading.

Townsend

COMPANY · ESTABLISHED 1816

Plants—New Brighton, Pa. · Chicago 38, Ill.

Division Sales Offices—Philadelphia, Detroit, Chicago

Sales Offices in Principal Cities

continuous feeding of automatics

FOLLANSBEE POLISHED BLUE STRIP can be fed directly into automatics—a continuous, time-saving supply system for any kind of metal-forming operation.

from coils of polished blue strip

FOLLANSBEE POLISHED BLUE has a high-gloss, intense blue finish which is the distinguishing characteristic of this superior strip, and a sales feature for any product in which it is used.

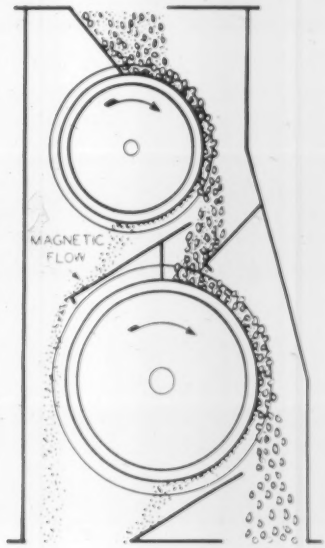
sets a fast production pace

FOLLANSBEE POLISHED BLUE STRIP is furnished in continuous coils for productioneering with automatic machines. There's a Follansbee Steel Representative nearby who can tell you more about Follansbee Specialty Steels.

FOLLANSBEE STEEL CORPORATION
GENERAL OFFICES, PITTSBURGH 30, PA.
COLD ROLLED STRIP • ELECTRICAL SHEETS • POLISHED BLUE SHEETS
SEAMLESS TERNE ROLL ROOFING
Sales Offices—New York, Philadelphia, Rochester, Cleveland, Detroit, Milwaukee. *Sales Agents*—Chicago, Indianapolis, Kansas City, Nashville, Los Angeles, San Francisco, Seattle; Toronto and Montreal, Canada. *Plants*—Follansbee, W. Va.
FOLLANSBEE METAL WAREHOUSES
Pittsburgh, Pa. • Rochester, N. Y. • Fairfield, Conn.

fine borings containing less than 10 per cent iron contamination.

Two magnetic Perma-Drums, one mounted directly above the other, are enclosed in a dust-tight housing. Each drum consists of a stationary nonelectric Alnico magnet assembly around which revolves a nonribbed armor plate drum shell. Nonmagnetic material flows over the drum shell in a



normal trajectory. Magnetics are held fast to the surface of the shell for one half revolution until they are carried to a point beyond the magnetic field, to be separately discharged. As the material is spouted from the first to the second drum, it is turned over so that a more effective secondary separation takes place. Complete unit is available in nine different sizes.

Check No. 7 on Reply Card for more Details

Portability Is Oven Feature

Field tests of the portable oven made by Grieve-Hendry Co. Inc., 1101 N. Paulina St., Chicago 22, Ill., indicate it is practicable for baking finishes, dehydrating, drying after cleaning and preheating molds. Fresh air is drawn in and stale air driven out through vents by means of a fan driven by a motor mounted on the outside of the unit. No stratification is possible and change of air and forced circulation is advantageous for any dehydration and baking process. Adjustable damper gives wide range of constant temperature.

Oven is so constructed that one will nest on top of another. Construction is heavy gage steel. Model CR-1 has single phase 110 v ac motor and requires no special wiring. Direct current units are available. Interior dimensions are: 29 inches wide, 24 inches deep and 20½ inches high.

ELECTRICALLY OPERATED
BLOOM AND SLAB SHEAR

FAST-WORKING 1150 TON
HOT UP-CUT BLOOM AND SLAB SHEAR

FOR CUTTING BLOOMS UP TO 16" x 16" OR SLABS UP TO 40" x 6½"

OPERATION FROM STAND STILL WITHOUT FLY WHEEL OR CLUTCH

WIDE RANGE OF CUTTING SPEEDS

INSTALLED IN ONE OF THE MOST MODERN BLOOMING AND SLABBING MILLS

★

WE BUILD
HEAVY
HOT AND COLD
SHEARS AND SAWS

AND ANY OTHER AUXILIARY MACHINERY FOR THE FERROUS AND NON-FERROUS INDUSTRIES

LOEWY ROLLING MILL DIVISION
HYDROPRESS · INC ·
ROLLING MILLS AND ROLLING MILL EQUIPMENT

566 LEXINGTON AVENUE GENERAL ELECTRIC BUILDING AT 51st STREET NEW YORK 22

CHICAGO DETROIT SAN FRANCISCO SEATTLE WASHINGTON, D. C.

Removable shelf and drip pan are standard equipment. Oven is capable of heating to 225 F in 15 minutes.

Check No. 8 on Reply Card for more Details

Dry Fire Fighting

Dry chemical piped system designed for automatic protection of industrial fire hazards has been developed by Ansul Chemical Co., Marinette, Wis. It uses a dry chemical as the extinguishing agent and is operated by a heat-actuated device mechanism. When fire starts and temperature increases, air expands within the mechanism and trips a nitrogen cylinder release, pressurizing the dry chemical container. The chemical then is discharged through strategically located distribution heads onto the fire area. Manual operation as well as automatic is provided in all installations.

Check No. 9 on Reply Card for more Details

• • •

FOR ACCURACY: Vernier calipers from Sweden with positive accuracy to 0.001-inch for outside, inside, depth and thread measurements from 0 to 6 inches are available from Transocean Trading Co., Los Angeles 46, Calif. Precision ground measuring surfaces are glass hardened and lapped.

Check No. 10 on Reply Card for more Details

END MEASURE RODS: Swedish Gage Co., Detroit 4, Mich., offers end measuring rods that serve as a dependable and accurate means for obtaining hole spacings or setting table locations on jig bores and jigmils and other general purpose work. Each set consists of two each 1, 2, 3, 4, 5, and 6-inch measuring rods and four 12-inch measuring rods together with two 4-inch micrometer heads in a hardwood case.

Check No. 11 on Reply Card for more Details

LESS WASTE: More uniform coverage with less waste of spray is claimed for the new line of flat spray or fan nozzles announced by Bete Fog Nozzle Inc., Greenfield, Mass. There is less overspraying because of doubling up the sprays from adjacent nozzles with the result that combined coverage is uniform.

Check No. 12 on Reply Card for more Details

MEASURES ARGON FLOW: A new, direct reading combination regulator and flowmeter for the measurement of argon flow is announced by Linde Air Products Co., New York, N. Y. Known as R-502, it is designed for use with Heliarc welding, argon metal arc welding and other related processes. It has a three stage type regulator that maintains constant inlet pressure and accurate flow. Flowmeter, with fingertip control adjusting valve, permits steady flow rates up to 60 cu ft per hour.

Check No. 13 on Reply Card for more Details

DIRECT-READING TESTER: New-age International Inc., New York, N. Y., offers the portable, direct-reading Ernst hardness tester. Instrument can be used on curved as well as flat surfaces, if the radius of the curve is not less than ½-inch.

Check No. 14 on Reply Card for more Details

HOLDS TIGHT: Designed by Aviation Development Inc., Burbank, Calif., Pip'pins are quick-release pins used like bolts except that no other separate retaining items are needed. Pin is inserted into holes in the parts to be held. Once in play, they cannot work loose, and must be deliberately removed to effect disassembly of any units they were holding.

Check No. 15 on Reply Card for more Details

TEST TUBES: Model CR-30 cathode ray tube tester, announced by Precision Apparatus Co. Inc., Elmhurst, L. I., N. Y., is a complete self-contained instrument. It performs tests without removing tube from tube carton.

Check No. 16 on Reply Card for more Details

LOAD FROM REAR: Small parts bins, made by Stackbin Corp., Pawtucket, R. I., have been improved by the addition of scoops permitting bins to be filled from the rear. Scoop opening allows bin to be refilled without removal from stacked setups or interruption of assembly work. Parts feed automatically toward the front.

Check No. 17 on Reply Card for more Details

DEVICE FOR TRANSFORMER: A control device for operating the breaker reset handle of pole mounted CSP transformers from ground level is available from Westinghouse Electric Corp., Pittsburgh 30, Pa. Operation is by pulling steadily on one of the handles until transformer breaker handle assumes the on or off position. Breaker can also be reset after automatically tripping.

Check No. 18 on Reply Card for more Details

FOG LUBRICATION: Micro-Fog lubricator, introduced by C. A. Norgren Co., Denver 9, Colo., develops a true fog in which extremely minute and uniform size particles of lubricant remain in suspension in the air stream. Units are available in models to function over the range of 1 cfm at 10 psi up to 14 cfm at 80 psi. Eight models are offered, ¼ and ⅜-inch pipe size, and with both sizes available in bowl capacities of ½ and ½-pint.

Check No. 19 on Reply Card for more Details

IMPROVED BORING TOOL: Maxwell Co., Bedford, O., announces improvements in their E-Z set boring tools that include increased tool rigidity through incorporation of larger dove-tail areas, ground fit male and female dove-tail, micrometer-like adjustment which facilitates accuracy to within 0.0002-inch and elimination of distorting slots or gibs.

Check No. 20 on Reply Card for more Details

AMPLIFIER AND RECORDER: SR-4 strain gage amplifier and recorder assembly for static and dynamic load measurements is available from Baldwin Locomotive Works, Philadelphia 42, Pa. It is a direct-writing, inkless, vacuum tube voltmeter consisting of an alternating current powered strain gage amplifier, a D'Arsonval moving coil recording galvanometer and a paper drive mechanism.

Check No. 21 on Reply Card for more Details

REMOVES RUST, SCALE: D-Scale-RW, developed by Magnus Chemical Co. Inc., Garwood, N. J., is a compound used for descaling or derusting iron or steel parts in tumbling barrels. It can be used either where parts are self tumbled or with abrasive mediums. The compound does not throw off fumes.

Check No. 22 on Reply Card for more Details

AIR VIBRATORS: Series 79 air vibrators, introduced by Spo Inc., Cleveland 25, O., are designed for operation on standard 80 psi line pressure. They are recommended for use on hoppers, tables, molding machines, etc. Units are available in eight standard sizes and can be furnished with long stroke or with standard stroke piston to assure correct intensity of transmitted power.

Check No. 23 on Reply Card for more Details

FOR MORE INFORMATION

on the new products and equipment in this section, fill in a card. It will receive prompt attention.

The Market Outlook

METALWORKING companies are quickening efforts to get into defense work. With steel and other scarce metals increasingly difficult to obtain for regular operations, fabricators are deluging government procurement agencies with inquiries for bid lists hoping to line up emergency jobs. Some manufacturers envision the time as not far distant when they may be forced out of business for the duration of the emergency unless they can find a niche in the defense program. Government contracting is speeding up but it will take time for work to spread out through industry in the form of sub-contracts from prime contractors.

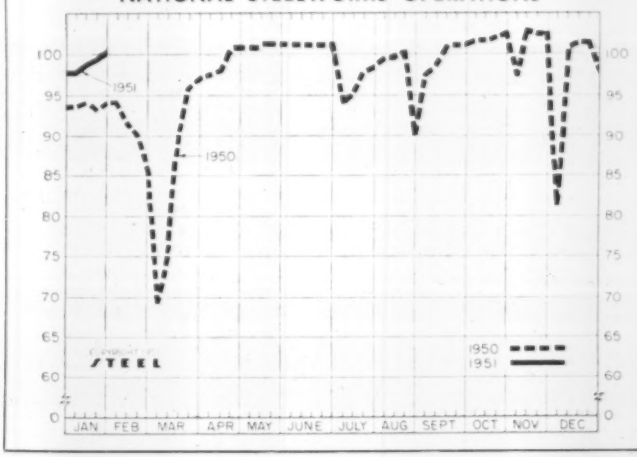
DEFENSE NEEDS— Defense steel requirements will be stepped up in second quarter. But details of most major programs still remain to be worked out. Allocations were set up last week for the railroad car program and for Great Lakes ore carriers for April only. Distribution was unchanged, but there may be some increase in allocations for the two succeeding months when action is taken on the matter in February. Special programs for locomotives, oil country goods and cargo vessels may come soon. These three programs appear the only new proposals of a semi-defense nature likely to be established for third quarter in addition to those already existing. There may be certain other programs of a military character, however.

CONTROLS— As supplies of steel and other metals for normal operations shrink speculation is rising as to when, if at all, something similar to the Controlled Materials Plan of World War II will be put into effect. The opinion prevails generally that such a distribution program could not possibly be made operative until third quarter at earliest. Meanwhile, control authorities are going along with the voluntary allocation system. Last week the National Production Authority amended its basic steel order, M-1, increasing most of the quantities of the various steel products which the mills must set aside for DO-rated orders. It also established specific inventory controls for most products at all levels of production and consumption, and added various items to the control list, including pig iron, castings and forgings, wire rope and strand, welded wire fabrics, and wire netting. Minimum mill quantities also were established on DO orders and order lead time was extended on a number of products.

PRODUCTION— Steel output last week is estimated at a record-breaking 2 million tons, the national ingot rate rising fractionally to just above the 100 per cent of capacity mark. Present high production rate, if continued uninterruptedly through the year, would result in annual output of over 105 million tons. Last year the industry produced 96,700,000 tons. The steel expansion program is being enlarged daily. Indications now are that by end of 1952 ingot capacity will top 117,500,000 net tons, more than 2 million tons above earlier estimates.

PRICES— In line with the request of stabilization authorities to voluntarily hold the price line, steel product quotations have been virtually frozen for the past several weeks at levels established in December. Consequently, projected freeze of schedules by the government has not aroused too much concern in the trade so long as prices are not rolled back beyond Jan. 1. Only minor changes in lists have been made since that date and then only by a few producers. STEEL's weighted index on finished steel holds at 171.92 and the arithmetical composite of $106. Pig iron composites are steady with No. 2 foundry, $52.54, basic, $52.16, and malleable, $53.27. The price composite on steelmaking scrap is unchanged at $46.33.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Jan. 27	Change	Same Week 1950	Same Week 1949
Pittsburgh	98	1*	95.5	99
Chicago	101.5	0.5	98	98.5
Eastern Pa.	99.5	0	86	97
Youngstown	106	0	100	105
Wheeling	98.5	1.5	100	86.5
Cleveland	102	2	93.5	97
Buffalo	104	0	95.5	104
Birmingham	100	0	100	100
New England	92	3	80	87
Cincinnati	106	4	103	103
St. Louis	88	7	87	84.5
Detroit	106	1*	106	104
Western	100.5	2.5	89	
Estimated national rate	100	0.5	94	99.5

Based on weekly steelmaking capacity of 1,969,035 net tons for 1951, 1,928,721 tons for second half 1950, 1,906,268 tons for first half 1950, 1,843,516 tons for 1949.

* Change from revised rate for preceding week.

Composite Market Averages

	Jan. 25 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100)	171.92	171.92	167.89	156.13	101.87
Index in cents per lb.	4.657	4.657	4.548	4.230	2.760
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$166.00	$166.00*	$163.50	$93.00	$58.27
No. 2 Fdry. Pig Iron, GT	52.54	52.54	52.54	46.22	25.42
Basic Pig Iron, GT	52.16	52.16	52.16	45.72	24.75
Malleable Pig Iron, GT	53.27	53.27	53.27	47.27	26.04
Steelmaking Scrap, GT	46.33	46.33	45.50	26.83	19.17

* Revised.

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39. Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown, Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Jan. 25 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.70	3.70	3.70	3.45	2.25
Bars, H.R., Chicago	3.70	3.70	3.70	3.45	2.25
Bars, H.R., del. Philadelphia	4.18	4.18	4.18	3.93	2.57
Bars, C.F., Pittsburgh	4.55	4.55	4.55	4.10–15	2.75
Shapes, Std., Pittsburgh	3.65	3.65	3.65	3.40	2.10
Shapes, Std., Chicago	3.65	3.65	3.65	3.40	2.10
Shapes, del. Philadelphia	3.90	3.90	3.90	3.46	2.215
Plates, Pittsburgh	3.70	3.70	3.70	3.50	2.25
Plates, Chicago	3.70	3.70	3.70	3.50	2.25
Plates, Contesville, Pa.	4.15	4.15	4.15	3.60	2.25
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.50	2.25
Plates, Claymont, Del.	4.15	4.15	4.15	3.60	2.25
Sheets, H.R., Pittsburgh	3.60–75	3.60–75	3.60–75	3.35	2.20
Sheets, H.R., Chicago	3.60	3.60	3.60	3.35	2.20
Sheets, C.R., Pittsburgh	4.35	4.35	4.35	4.10	3.05
Sheets, C.R., Chicago	4.35	4.35	4.35	4.10	3.05
Sheets, C.R., Detroit	4.55	4.55	4.55	4.30	3.15
Sheets, Galv., Pittsburgh	4.80	4.80	4.80	4.40	3.70
Strip, H.R., Pittsburgh	3.75–4.00	3.75–4.00	3.75–4.00	3.25	2.10
Strip, H.R., Chicago	3.50	3.50	3.50	3.25	2.10
Strip, C.R., Pittsburgh	4.65–5.35	4.65–5.35	4.65–5.35	4.15	2.80
Strip, C.R., Chicago	4.90	4.90	4.90	4.30	2.90
Strip, C.R., Detroit	4.35–5.60	4.35–5.60	4.35–5.60	4.35–40	2.90
Wire, Basic, Pittsburgh	4.85–5.10	4.85–5.10	4.85–5.10	4.50	2.75
Nails, Wire, Pittsburgh	5.90–6.20	5.90–6.20	5.90–6.20	5.30	2.80
Tin plate, box, Pittsburgh	$8.70	$8.70	$7.50	$7.50	$5.00

SEMIFINISHED

Billets, forging, Pitts. (NT)	$66.00	$66.00	$66.00	$63.00	$42.00
Wire rods, $\frac{7}{32}$–$\frac{9}{16}$", Pitts.	4.10–30	4.10–30	4.10–30	3.85	2.15

PIG IRON, Gross Ton

Bessemer, Pitts.	$53.00	$53.00	$53.00	$47.00	$26.25
Basic, Valley	52.00	52.00	52.00	46.00	25.25
Basic, del. Phila.	56.39	56.39	56.39	49.44	27.09
No. 2 Fdry, Pitts.	52.50	52.50	52.50	46.50	25.75
No. 2 Fdry, Chicago	52.50	52.50	52.50	46.50	25.75
No. 2 Fdry, Valley	52.50	52.50	52.50	46.50	25.75
No. 2 Fdry, Del. Phila.	56.89	56.89	56.89	49.94	27.59
No. 2 Fdry, Birm.	48.88	48.88	48.88	39.38–42.38	22.13
No. 2 Fdry (Birm.) del. Cin.	55.58	55.58	55.58	46.08	25.81
Malleable Valley	52.50	52.50	52.50	46.50	25.75
Malleable, Chicago	52.50	52.50	52.50	46.50	25.75
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	60.00	33.00
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	175.00	140.00*

* Delivered, Pittsburgh.

SCRAP, Gross Ton

No. 1 Heavy Melt. Pitts.	$46.50	$46.50	$46.50	$30.00	$20.00
No. 1 Heavy Melt. E. Pa.	47.50	47.50	45.00	23.00	18.75
No. 1 Heavy Melt. Chicago	45.00	45.00	45.00	27.50	18.75
No. 1 Heavy Melt. Valley	46.25	46.25	46.25	30.25	20.00
No. 1 Heavy Melt. Cleve.	45.75	45.75	45.75	27.25	19.50
No. 1 Heavy Melt. Buffalo	51.50	44.88	44.88	27.75	19.25
Rails, Rerolling, Chicago	67.00	67.00	67.00	39.50	22.25
No. 1 Cast, Chicago	62.00	62.00	63.00	40.50	20.00

COKE, Net Ton

Beehive, Furn., Connisvl.	$14.75	$14.75	$14.75	$13.25	$7.50
Beehive, Fdry., Connisvl.	17.50	17.50	17.50	15.50	8.25
Oven Fdry., Chicago	21.00	21.00	21.00	20.00	13.00

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	18.50	12.00
Zinc, E. St. Louis	17.50	17.50	17.50	9.75	8.25
Lead, St. Louis	16.80	16.80	16.80	11.80	6.35
Tin, New York	185.00	176.00	151.00	75.50	52.00
Aluminum, del.	19.00	19.00	19.00	17.00	15.00
Antimony, Laredo, Tex.	32.00	32.00	32.00	28.75	14.50
Nickel, refinery, duty paid	50.50	50.50	50.50	40.00	35.00

Pig Iron

For key to producing companies, turn next page.
Minimum delivered prices do not include 3% federal tax

PIG IRON Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$54.00	$54.50	$56.00	$55.50
Brooklyn, N.Y., del.	....	58.79	59.29	....
Newark, del.	56.63	57.13	57.63	58.13
Philadelphia, del.	56.39	56.89	57.39	57.89
Birmingham District				
Alabama City, Ala. R2	48.38	48.88	....	....
Birmingham R2	48.38	48.88	....	....
Birmingham S9	48.38	48.88	....	....
Woodward, Ala. W15	48.38	48.88	....	....
Cincinnati, del.	....	55.58	....	....
Buffalo District				
Buffalo R2	52.00	52.50	53.00	....
Buffalo H1	52.00	52.50	53.00	....
Tonawanda, N.Y., W12	52.00	52.50	53.00	....
No. Tonawanda, N.Y., T9	....	52.50	53.00	....
Boston, del.	61.26	61.76	62.20	....
Rochester, N.Y., del.	54.63	55.13	55.63	....
Syracuse, N.Y., del.	55.58	56.08	56.58	....
Chicago District				
Chicago I-3	52.00	52.50	52.50	53.00
Gary, Ind. U5	52.00	....	52.50	....
Indiana Harbor, Ind. I-2	52.00	....	52.50	....
So. Chicago, Ill. W14	52.00	52.50	52.50	....
So. Chicago, Ill., Y1	52.00	52.50	52.50	....
So. Chicago, Ill. U5	52.00	....	52.50	53.00
Milwaukee, del.	53.89	54.39	54.89	54.89
Muskegon, Mich., del.	....	57.93	57.93	....
Cleveland District				
Cleveland A7	52.00	52.50	53.50	53.00
Cleveland R2	52.00	52.50	53.50	....
Akron, del. from Cleve.	54.39	54.89	54.89	54.39
Lorain, O. N3	52.00	....	....	53.00
Duluth I-3	....	....	53.50	....
Erie, Pa. I-3	52.00	52.50	52.50	53.00
Everett, Mass. E1	....	53.25	53.75	....
Fontana, Calif. K1	58.00	58.50	....	....
Geneva, Utah G1	52.00	52.50	....	....
Seattle, Tacoma, Wash., del.	....	60.20	....	....
Portland, Oreg., del.	....	60.20	....	....
Los Angeles, San Francisco del.	58.70	60.20	....	....
Granite City, Ill. K7	53.90	54.40	54.90	....
St. Louis, del. (inc. tax)	54.65	55.15	55.65	....
Ironton, Utah C11	52.00	52.50	....	....
Lone Star, Tex. L6	48.00	*48.50	48.50	....
Minnequa, Colo. C10	54.00	55.00	55.00	....
Pittsburgh District				
Neville Island, Pa. P6	....	52.50	52.50	53.00
Pitts., N&S. sides, Ambridge, Aliquippa, del.	....	53.89	53.89	54.39
McKees Rocks, del.	....	53.45	53.45	53.95
Lawrenceville, Homestead, McKeesport, Monaca, del.	....	53.94	53.94	54.44
Verona, del.	....	54.40	54.40	54.90
Brackenridge, del.	....	54.63	54.63	55.13
Bessemer, Pa. U5	52.00	....	52.50	53.00
Clairton, Rankin, So. Duquesne, Pa. U5	52.00	....	....	....
McKeesport, Pa. N3	52.00	....	....	53.00
Monessen, Pa. P7	54.00	....	....	....
Sharpsville, Pa. S6	....	....	52.50	53.00
Steelton, Pa. B2	54.00	54.50	55.00	55.50
Swedeland, Pa. A3	56.00	56.50	57.00	57.50
Toledo, O. I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.01	57.51	....	....
Troy, N.Y. R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard, O. Y1	52.00	52.50	52.50	....
Youngstown Y1	52.00	52.50	52.50	....
Youngstown U5	52.00	....	....	53.00
Mansfield, O., del.	56.26	56.76	56.76	57.26

* Low phos. southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1%, or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$62.50
Buffalo H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for each 0.045% max. P)

Niagara Falls, N.Y. P15	$85.00
Keokuk, Iowa, Openhearth & Fdry, frt, allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb. piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., O.H. & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos. semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$66.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Steelton, Pa. B2	60.00
Philadelphia delivered	63.00
Troy, N.Y. R2	60.00

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Semifinished and Finished Steel Products

Mill prices as reported to STEEL Jan. 25, 1951; cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ....$79.00
Munhall,Pa. U5 .....52.00

INGOTS, Alloy (NT)
Detroit R7 .....$54.00
Fontana,Calif. K1 ....80.00
Houston,Tex. S5 .....62.00
Midland,Pa. C18 .....54.00
Munhall,Pa. U5 .....54.00
So.Duquesne,Pa. U5 ..54.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$56.00
Clairton,Pa. U5 .....56.00
Ensley,Ala. T2 .....56.00
Fairfield,Ala. T2 .....56.00
Fontana,Calif. K1 ....75.00
Gary,Ind. U5 .....56.00
Johnstown,Pa. B2 ....56.00
Lackawanna,N.Y. B2 ..56.00
Munhall,Pa. U5 .....56.00
So.Chicago,Ill. U5 ....56.00
So.Duquesne,Pa. U5 ..56.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$66.00
Buffalo R2 .....66.00
Canton,O. R2 .....66.00
Clairton,Pa. U5 .....66.00
Cleveland R2 .....66.00
Conshohocken,Pa. A3 ..73.00
Detroit R7 .....69.00
Ensley,Ala. T2 .....66.00
Fairfield,Ala. T2 .....66.00
Fontana,Calif. K1 ....85.00
Gary,Ind. U5 .....66.00
Geneva,Utah G1 .....66.00
Houston,Tex. S5 .....74.00
Johnstown,Pa. B2 ....66.00
Lackawanna,N.Y. B2 ..66.00
LosAngeles B3 .....85.00
Munhall,Pa. U5 .....66.00
Seattle B3 .....85.00
So.Chicago R2,U5,W14.66.00
So.Duquesne,Pa. U5 ..66.00
So.SanFrancisco B3 ..85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$70.00
Buffalo R2 .....70.00
Canton,O. R2 .....70.00
Canton,O.(29) T7 ....66.00
Conshohocken,Pa. A3 ..77.00
Detroit R7 .....73.00
Fontana,Calif. K1 ....89.00
Gary,Ind. U5 .....70.00
Houston,Tex. S5 .....78.00
Ind.Harbor,Ind. Y1 ....70.00
Johnstown,Pa. B2 ....70.00
Lackawanna,N.Y. B2..70.00
LosAngeles B3 .....90.00
Massillon,O. R2 .....70.00
Midland,Pa. C18 .....70.00
Munhall,Pa. U5 .....70.00
So.Chicago R2,U5,W14.70.00
So.Duquesne,Pa. U5 ...70.00
Warren,O. C17 .....70.00
Struthers,O. Y1 .....70.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 .....$82.00
Cleveland R2 .....82.00
Fontana,Calif. K1 ....103.00
Gary,Ind. U5 .....82.00
Massillon,O. R2 .....82.00
So.Chicago,Ill. R2 ....82.00
So.Duquesne,Pa. U5 ...82.00

SHEET BARS (NT)
Fontana,Calif. K1 ...$89.00

SKELP
Aliquippa,Pa. J5 .....3.45
Munhall,Pa. U5 .....3.35
Warren,O. R2 .....3.35
Youngstown R2, U5 ...3.35

WIRE RODS
AlabamaCity,Ala. R2 ..4.10
Buffalo W12 .....4.10
Cleveland A7 .....4.10
Donora,Pa. A7 .....4.10
Fairfield,Ala. T2 .....4.10
Fontana,Calif. K1 ....4.90
Houston,Tex. S5 .....4.50
Johnstown,Pa. B2 ....4.10
Joliet,Ill. A7 .....4.10
LosAngeles B3 .....4.90
Minnequa,Colo. C10 ....4.35
Monessen,Pa. P7 .....4.30
No.Tonawanda,N.Y.B11 4.10
Pittsburg,Calif. C11 ....4.75
Portsmouth,O. P12 ....4.20
Roebling,N.J. R5 .....4.20
So.Chicago,Ill. R2 ....4.10
SparrowsPoint,Md. B2..4.20
Sterling,Ill.(1) N15 ....4.10
Struthers,O. Y1 .....4.10
Torrance,Calif. C11 ....4.90
Worcester A7 .....4.40

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..3.60
Aliquippa,Pa. J5 .....3.65
Bessemer,Ala. T2 .....3.65
Bethlehem,Pa. B2 .....3.70
Clairton,Pa. U5 .....3.65
Fairfield,Ala. T2 .....3.65
Fontana,Calif. K1 ....4.25
Gary,Ind. U5 .....3.65
Geneva,Utah G1 .....3.65
Houston,Tex. S5 .....4.05
Ind.Harbor,Ind. I-2 ....3.65
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 ....4.25
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.25
Minnequa,Colo. C10 ....4.10
Munhall,Pa. U5 .....3.65
Niles,Calif.(22) P1 ....4.85
Phoenixville,Pa. P4 ....4.95
Portland,Oreg. O4 .....4.50
Seattle B3 .....4.30
So.Chicago,Ill. U5, W14.3.65
So.SanFrancisco B3 ....4.20
Torrance,Calif. C11 ....4.25
Weirton,W.Va. W6 ....3.90

Alloy Stand. Shapes
Clairton,Pa. U5 .....4.35
Fontana,Calif. K1 ....5.55
Munhall,Pa. U5 .....4.35
So.Chicago,Ill. U5 .....4.35

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.50
Bessemer,Ala. T2 .....5.50
Bethlehem,Pa.(14) B2 ..5.50
Clairton,Pa. U5 .....5.50
Fairfield,Ala. T2 .....5.50
Fontana,Calif. K1 .....6.10
Gary,Ind. U5 .....5.50
Geneva,Utah G1 .....5.50
Ind.Harbor,Ind. I-2 ....5.50
Ind.Harbor,Ind. Y1 ....6.00
Johnstown,Pa. B2 .....5.50
Lackawanna,N.Y.(14)B2 5.50
LosAngeles B3 .....6.05
Munhall,Pa. U5 .....5.50
Seattle B3 .....6.10
So.Chicago,Ill. U5 .....5.50
So.SanFrancisco B3 ....6.00
Struthers,O. Y1 .....6.00

Wide Flange
Bethlehem,Pa. B2 .....3.70
Fontana,Calif. K1 .....4.65
Lackawanna,N.Y. B2 ....3.70
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 .....3.65

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....5.50
Lackawanna,N.Y. B2 ....5.50
Munhall,Pa. U5 .....5.45
So.Chicago,Ill. U5 .....5.45

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ....4.45
Lackawanna,N.Y. B2 ....4.45
Munhall,Pa. U5 .....4.45
So.Chicago,Ill. U5 .....4.45

BEARING PILES
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 .....3.65

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.65
Bessemer,Ala. T2 .....5.65
Clairton,Pa. U5 .....5.65
Cleveland J5, R2 .....5.65
Conshohocken,Pa. A3 ..5.90
Ecorse,Mich. G5 .....5.85
Fairfield,Ala. T2 .....5.65
Fontana,Calif.(30) K1 ..6.25
Gary,Ind. U5 .....5.65
Geneva,Utah G1 .....5.65
Ind.Harbor,Ind. I-2 ....5.65
Ind.Harbor,Ind. Y1 ....6.15
Johnstown,Pa. B2 .....5.65
Munhall,Pa. U5 .....5.65
Pittsburgh J5 .....5.65
Seattle B3 .....6.55
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. U5 .....5.65
SparrowsPoint,Md. B2 ..5.65
Warren,O. R2 .....5.65
Youngstown Y1 .....6.15

PLATES, Open-Hearth Alloy
Claymont,Del. W16 ....4.85
Coatesville,Pa. L7 ....5.25
Conshohocken,Pa. A3 ..5.05
Fontana,Calif. K1 .....5.70
Gary,Ind. U5 .....4.75
Johnstown,Pa. B2 .....4.75
Munhall,Pa. U5 .....4.75
Sharon,Pa. S3 .....5.20
So.Chicago,Ill. U5 .....4.75
SparrowsPoint,Md. B2..4.75

FLOOR PLATES
Cleveland J5 .....4.75
Conshohocken,Pa. A3 ..4.75
Harrisburg,Pa. C5 .....5.95
Ind.Harbor,Ind. I-2 ....4.75
Munhall,Pa. U5 .....4.75
So.Chicago,Ill. U5 .....4.75

PLATES, Carbon A.R.
Fontana,Calif. K1 .....5.45
Geneva,Utah G1 .....4.85

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Ashland,Ky(15) A10 ..3.70
Bessemer,Ala. T2 .....3.70
Clairton,Pa. U5 .....3.70
Claymont,Del. W16 ....4.15
Cleveland J5, R2 .....3.70
Coatesville,Pa. L7 ....4.15
Conshohocken,Pa. A3 ..4.15
Ecorse,Mich. G5 .....3.75
Fairfield,Ala. T2 .....3.70
Fontana,Calif.(30) K1 ..4.30
Gary,Ind. U5 .....3.70
GraniteCity,Ill. G4 ....4.40
Geneva,Utah G1 .....3.70
Harrisburg,Pa. C5 .....4.95
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ..3.70
Minnequa,Colo. C10 ....4.50
Munhall,Pa. U5 .....3.70
Pittsburgh J5 .....3.70
Seattle B3 .....4.60
Sharon,Pa. S3 .....3.95
So.Chicago,Ill. U5, W14.3.70
SparrowsPoint,Md. B2..3.70
Steubenville,O. W10 ....3.70
Warren,O. R2 .....3.70
Weirton,W.Va. W6 .....4.00
Youngstown R2, U5, Y1.3.70

PLATES, Wrought Iron
Economy,Pa. B14 .....8.60

PLATES, Ingot Iron
Ashland,c.l.(15) A10 ..3.95
Ashland,lcl.(15) A10 ..4.45
Cleveland,c.l. R2 .....4.30
Warren,O. c.l. R2 .....4.30

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Alton,Ill.(1) L1 .....3.95
Atlanta,Ga. A11 .....4.25
Bessemer,Ala. T2 .....3.70
Buffalo R2 .....3.70
Canton,O. R2 .....3.70
Clairton,Pa. U5 .....3.70
Cleveland R2 .....3.70
Detroit R7 .....3.85
Ecorse,Mich G5 .....3.65
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 ....4.30
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.40
Milton,Pa. B6 .....4.20
Minnequa,Colo. C10 ....4.15
Niles,Calif. P1 .....5.05
N.Tonawanda,N.Y. B11.3.70
Pittsburg,Calif. C11 ....4.40
Pittsburgh J5 .....3.70
Portland,Oreg. O4 .....4.65
Seattle B3, N14 .....4.45
So.Chicago R2, U5, W14.3.70
So.Duquesne,Pa. U5 ....3.70
So.SanFran.,Cal. B3 ....4.45
Struthers,O. Y1 .....3.70
Torrance,Calif. C11 ....4.40
Weirton,W.Va. W6 .....3.85
Youngstown R2, U5 ....3.70

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 .....3.70
Atlanta A11 .....4.25
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ....3.70
Niles,Calif. P1 .....5.05
Portland,Oreg. O4 .....4.65
SanFrancisco S7 .....4.85

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 .....3.90

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....4.30
Buffalo R2 .....4.30
Canton,O. R2 .....4.30
Canton,O.(29) T7 .....3.95
Clairton,Pa. U5 .....4.30
Detroit R7 .....4.45
Ecorse,Mich. G5 .....4.25
Fontana,Calif. K1 .....5.35
Gary,Ind. U5 .....4.30
Houston,Tex. S5 .....4.70
Ind.Harbor,Ind. I-2, Y1.4.30
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 ....4.90
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 .....5.35
Massillon,O. R2 .....4.30
Midland,Pa. C18 .....4.30
So.Chicago R2, U5, W14.4.30
So.Duquesne,Pa. U5 ...4.30
Struthers,O. Y1 .....4.30
Warren,O. C17 .....4.30
Youngstown U5 .....4.30

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....4.55
Gary,Ind. U5 .....4.55
Youngstown U5 .....4.55

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.55
Atlanta A11 .....5.35
Bessemer,Ala. T2 .....5.55
Bethlehem,Pa. B2 .....5.55
Clairton,Pa. U5 .....5.55
Cleveland R2 .....5.55
Ecorse,Mich. G5 .....5.55
Fairfield,Ala. T2 .....5.55
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.55
Ind.Harbor,Ind. I-2 ....5.55
IndianaHarbor,Ind. Y1..6.05
Johnstown,Pa. B2 .....5.55
Lackawanna,N.Y. B2 ...5.55
LosAngeles B3 .....6.25
Pittsburgh J5 .....5.55
Seattle B3 .....6.30
So.Duquesne,Pa. U5 ...5.55
So.SanFrancisco B3 ...6.30
Struthers,O. Y1 .....6.05
Youngstown U5 .....5.55

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....4.55
BeaverFalls,Pa.M12,R2 ..4.55
Buffalo B5 .....4.60
Camden,N.J. P13 .....5.00
Carnegie,Pa. C12 .....4.55
Chicago W18 .....4.55
Cleveland A7, C20 ....4.55
Detroit P17 .....4.70
Donora,Pa. A7 .....4.55
Ecorse,Mich. G5 .....4.35
Elyria,O. W8 .....4.55
FranklinPark,Ill. N5 ...4.55
Gary,Ind. R2 .....4.55
GreenBay,Wis. F7 ....4.55
Hammond,Ind. I.2, M13.4.55
Hartford,Conn. R2 .....5.10
Harvey,Ill. B5 .....4.55
LosAngeles R2 .....6.00
Mansfield,Mass. B5 ....5.10
Massillon,O. R2, R8 ....4.55
Midland,Pa. C18 .....4.55
Monaca,Pa. S17 .....4.55
Newark,N.J. W18 .....5.00
Plymouth,Mich. P5 .....4.80
Pittsburgh J5 .....4.55
Putnam,Conn. W18 .....5.10
Readville,Mass. C14 ...5.10
St. Louis,Mo. M5 .....4.95
So.Chicago,Ill. W14 ....4.55
SpringCity,Pa.(5) K3 ...5.00
Struthers,O. Y1 .....4.55
Waukegan,Ill. A7 .....4.55
Youngstown F3, Y1 ....4.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....5.40
BeaverFalls,Pa. M12 ....5.40
Bethlehem,Pa. B2 .....5.40
Buffalo B5 .....5.40
Camden,N.J. P13 .....5.80
Canton,O. R2 .....5.40
Canton,O.(29) T7 .....4.90
Carnegie,Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7 .....5.45
Cleveland C20 .....5.40
Detroit P17 .....5.55
Donora,Pa. A7 .....5.45
Elyria,O. W8 .....5.40
Gary,Ind. R2 .....5.40
Hammond,Ind. I.2, M13.5.40
Hartford,Conn. R2 .....5.85
Harvey,Ill. B5 .....5.40
Lackawanna,N.Y. B2 ...5.40
Mansfield,Mass. B5 ....5.85
Massillon,O. R2, R8 ...5.40
Midland,Pa. C18 .....5.40
Monaca,Pa. S17 .....5.40
Newark,N.J. W18 .....5.75
Plymouth,Mich. P5 .....5.60
So.Chicago,Ill. R2, W14.5.40
Struthers,O. Y1 .....5.40
Warren,O. C17 .....5.40
Waukegan,Ill. A7 .....5.45
Worcester,Mass. A7 ....5.75
Youngstown F3, Y1 ....5.40

RAIL STEEL BARS
ChicagoHts.(3.4)I-2, C2 4.75
Franklin,Pa.(3.4) F5 ...4.75
FortWorth,Tex.(26) T4..5.40
Huntngtn,W.Va.(3) W7 .5.50
Marion,O.(3) P11 .....4.75
Moline,Ill.(3) R2 .....3.80
Tonawanda(3.4) B12 ....4.75
Williamsport(3) S19 ....5.00
Williamsport(4) S19 ....5.10

BARS, Wrought Iron
Dover,N.J.(Staybolt)U1 15.00
Dover(Eng.Bolt) U1 ..13.50
Dover(Wrgt.Iron) U1 .12.25
Economy,Pa.(S.R.) B14.9.60
Economy,Pa.(D.R.)B14 11.90
Economy(Staybolt)B14 12.20
McK.Rks.(Staybolt) L5.14.50
McK.Rks.(S.R.) L5 ...9.60
McK.Rks.(D.R.) L5 ..13.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..3.70
Alton,Ill.(6) L1 .....3.70
Atlanta A11 .....4.25
Buffalo R2 .....3.70
Cleveland R2 .....3.70
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2, Y1 3.70
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 ....4.30
Lackawanna,N.Y. B2 ...3.70
LosAngeles B3 .....4.40
Milton,Pa. B6 .....4.20
Minnequa,Colo. C10 ....4.50
Niles,Calif. P1 .....5.05
Pittsburg,Calif. C11 ....4.40
Pittsburgh J5 .....3.70
SanFrancisco S7 .....4.60
SandSprings,Okla. S5 ..4.60
Seattle B3, N14 .....4.45
So.Chicago,Ill. R2 .....3.70
So.Duquesne,Pa. U5 ...3.70
So.SanFrancisco B3 ....4.45
SparrowsPoint,Md. B2 ..3.70
Struthers,O. Y1 .....3.70
Torrance,Calif. C11 ....4.40
Youngstown R2, U5 ....3.70

BARS, Reinforcing (Fabricated; to Consumers)
Huntington,W.Va. W7 ..5.50
Johnstown, ½-1" B2 ...4.75
LosAngeles B3 .....5.45
Marion,O. P11 .....5.00
Seattle B3, N14 .....5.55
So.SanFrancisco B3 ....5.45
SparrowsPt., ¼-1" B2..4.75
Williamsport,Pa. S19 ...5.10

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 ..3.60
Ashland,Ky.(8) A10 ...3.60
Butler,Pa. A10 .....3.60
Cleveland J5, R2 .....3.60
Conshohocken,Pa. A3 ..4.00
Detroit M1 .....4.40
Ecorse,Mich.(8) G5 .....3.80
Fairfield,Ala. T2 .....3.60
Fontana,Calif. K1 .....4.55
Gary,Ind. U5 .....3.60
Geneva,Utah G1 .....3.70
GraniteCity,Ill. G4 ....4.30
Ind.Harbor,Ind. I-2, Y1.3.60
Irvin,Pa. U5 .....3.60
Lackawanna,N.Y. B2 ...3.60
Munhall,Pa. U5 .....3.60
Niles,O. N12 .....5.25
Pittsburg,Calif. C11 ....4.30
Pittsburgh J5 .....3.60
Sharon,Pa. S3 .....4.00
So.Chicago,Ill. W14 ....3.60
SparrowsPoint,Md. B2 ..3.60
Steubenville,O. W10 ....3.60
Torrance,Calif. C11 ....4.30
Warren,O. R2 .....3.60
Weirton,W.Va. W6 .....3.60
WestLeechburg,Pa. A4..3.75
Youngstown U5, Y1 ...3.60

SHEETS, H.R (19 gage)
AlabamaCity,Ala. R2 ..4.75
Dover,O. R1 .....5.65
Ind.Harbor,Ind. I-2 ....5.40
Mansfield,O. E6 .....5.65
Niles,O. N12 .....5.75
Torrance,Calif. C11 .....5.40

SHEETS, H-R (14-ga., heavier) High-Strength Low-Alloy
Cleveland J5, R2 .....5.40
Conshohocken,Pa. A3 ..5.65
Ecorse,Mich. G5 .....5.50
Fairfield,Ala. T2 .....5.40
Fontana,Calif. K1 .....6.35
Gary,Ind. U5 .....5.40
Ind.Harbor,Ind. I-2 ....5.40
IndianaHarbor,Ind. Y1..5.90
Irvin,Pa. U5 .....5.40
Lackawanna(35) B2 ....5.40
Pittsburgh J5 .....5.40
Sharon,Pa. S3 .....5.40
So.Chicago,Ill. U5 .....5.40
SparrowsPoint(36) B2 ..5.40
Warren,O. R2 .....5.40
Weirton,W.Va. W6 .....5.75
Youngstown U5 .....5.40
Youngstown Y1 .....5.90

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 .....6.55
Ecorse,Mich. G5 .....6.65
Fontana,Calif. K1 .....7.50
Gary,Ind. U5 .....6.55
IndianaHarbor,Ind. Y1 ..7.06
IndianaHarbor,Ind. I-2 ..6.55
Irvin,Pa. U5 .....6.65
Lackawanna(37) B2 ....6.55
Pittsburgh J5 .....6.55
SparrowsPoint(38) B2 ..6.55
Warren,O. R2 .....6.55
Weirton,W.Va. W6 .....6.90
Youngstown Y1 .....7.06

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.35
Cleveland J5, R2	4.35
Ecorse,Mich. G5	4.35
Fairfield,Ala. T2	4.35
Follansbee,W.Va. F4	4.35
Fontana,Calif. K1	5.30
Gary,Ind. U5	4.35
GraniteCity,Ill. G4	5.05
Ind.Harbor,Ind. I-2, Y1	4.35
Irvin,Pa. U5	4.35
Lackawanna,N.Y. B2	4.35
Middletown,O. A10	4.35
Pittsburg,Calif. C11	5.30
Pittsburgh J5	4.35
SparrowsPoint,Md. B2	4.35
Steubenville,O. W10	4.35
Warren,O. R2	4.35
Weirton,W.Va. W6	4.35
Youngstown Y1	4.35

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala., R2	4.80
Ashland,Ky.(8) A10	4.80
Canton,O. R2	4.80
Dover,O. R1	5.50
Fairfield,Ala. T2	4.80
Gary,Ind. U5	4.80
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. I-2	4.80
Irvin,Pa. U5	4.80
Kokomo,Ind.(13) C16	5.20
MartinsFerry,O. W10	4.80
Niles,O. N12	6.00
Pittsburg,Calif. C11	5.55
SparrowsPoint,Md. B2	4.80
Steubenville,O. W10	4.80
Torrance,Calif. C11	5.55
Weirton,W.Va. W6	4.80

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5	7.20
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	5.35
Irvin,Pa. U5	5.35
Kokomo,Ind.(13) C16	5.75
Niles,O. N12	6.55

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.05
Middletown,O. A10	5.05

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.65
Niles,O. R2 (28)	5.65
Weirton,W.Va. W6	5.50

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.70

SHEETS, Drum Body

Pittsburg,Calif. C11	4.30
Torrance,Calif. C11	4.30

SHEETS, Well Casing

Fontana,Calif. K1	5.10
Torrance,Calif. C11	5.10

BLUED Stock, 29 Ga.

Yorkville,O. W10	6.80
Follansbee,W.Va.(23) F4	6.85

ROOFING SHORT TERNES (Package; 8 lb coated)

Gary,Ind. U5	$17.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.60
Gary,Ind. U5	7.50
Irvin,Pa. U5	7.50
SparrowsPoint,Md. B2	7.60
Yorkville,O. W10	7.50

SHEETS, Lt. Coated Ternes, 6lb

Yorkville,O. W10	$8.40

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.50
Yorkville,O. W10	9.50

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10	5.20
Gary,Ind. U5	5.20
Mansfield,O. E6	6.05
Middletown,O. A10	5.20
Niles,O. N12	6.00
Weirton,W.Va. W6	5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.60

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.65
Cleveland R2	4.65
Ecorse,Mich. G5	4.70
Gary,Ind. U5	4.65
GraniteCity,Ill. G4	5.35
Ind.Harbor,Ind. I-2	4.65
Irvin,Pa. U5	4.65
Middletown,O. A10	4.65
Youngstown Y1	4.65

SHEETS, Culvert No. 16

	Cu Alloy	Cu Fe
Ashland A10	5.60	...
Canton,O. R2	5.65	6.10
Fairfield,Ala. T2	5.60	5.85
Gary U5	5.60	5.85
IndianaHarbor I-2	5.60	5.85
Irvin,Pa. U5	5.60	5.85
Kokomo C16	6.25	...
MartinsFy.O. W10	5.60	5.85
Pittsburg,Cal. C11	6.35	...
SparrowsPt. B2	5.60	...
Torrance,Cal. C11	6.35	...

SHEETS, Culvert, No. 16 Corrugated Ingot Iron

Ashland,Ky. A10	5.85
Fairfield,Ala. T2	5.60

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland(8) A10	3.85
Cleveland R2	4.20
Ind.Harbor,Ind. I-2	3.85
Warren,O. R2	4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.95
Middletown,O. A10	4.85
Warren,O. R2	4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.05
Canton,O. R2	5.55

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.30
Middletown,O. A10	5.30

SHEETS, ALUMINIZED

Butler,Pa. A10	8.15

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind. U5	7.15	7.40	7.80
GraniteCity,Ill. *G4	7.35	7.60	8.00
Ind.Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.80
Pittsburg,Calif. C11	7.90	8.15	8.40
SparrowsPoint,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON, H.R. or C.R. COILS (Cut Lengths ½c lower)

	Field	Armature	Electric	Motor	Dynamo
BeechBottom W10 (cut lengths)	...	...	7.25	8.50	9.30
Brackenridge,Pa. A4	...	...	7.75	9.00	9.80
GraniteCity,Ill.G4 (cut lengths)	...	...	7.95	9.20	...
Ind.Harbor,Ind. I-2	6.95	7.25	(34)	...	...
Mansfield,O. E6 (cut lengths)	7.10	7.25	7.75	9.00	9.80
Niles,O. N12 (cut lengths)	...	6.75	7.25	...	...
Vandergrift,Pa. U5	...	7.25	7.75	9.00	9.80
Warren,O. R2	6.95	7.25	7.75	9.00	9.80
Zanesville,O. A10	...	7.25	7.75	9.00	9.80

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths ½c lower)

Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35	...	...	...
Vandergrift,Pa. U5	10.35	10.90	11.60	12.40
Warren,O. R2	10.35	...	...	...
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	...	...	14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

TIN PLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa J5	$8.45	$8.70
Fairfield,Ala. T2	8.55	8.80
Gary U5	8.45	8.70
Ind.Har. I-2, Y1	8.45	8.70
Irvin,Pa. U5	8.45	8.70
Pitts.,Cal. C11	9.20	9.40
Sp.Pt.,Md. B2	8.55	8.80
Warren R2	8.45	8.70
Weirton W6	8.45	8.70
Yorkville,O. W10	8.45	8.70

CANMAKING BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.25
Fairfield,Ala. T2	6.35
Gary Ind. U5	6.25
GraniteCity,Ill. G4	6.40
Ind.Harbor,Ind. I-2, Y1	6.25
Irvin,Pa. U5	6.25
Niles,O. R2	6.25
Pittsburg,Calif. C11	7.00
SparrowsPoint,Md. B2	6.35
Warren,O. R2	6.25
Weirton,W.Va. W6	6.25
Yorkville,O. W10	6.25

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	5.85
Gary,Ind. U5	5.85
GraniteCity,Ill. G4	6.05
Ind.Harbor,Ind. Y1	5.30
SparrowsPoint,Md. B2	5.35
Irvin,Pa. U5	5.85
Yorkville,O. W10	6.15

STRIP, Hot-Rolled, High-Strength Low-Alloy

Atlanta(9) A11	5.10
Bessemer,Ala. T2	5.30
Conshohocken,Pa. A3	5.35
Ecorse,Mich. G5	5.40
Fairfield,Ala. T2	5.30
Fontana,Cal. K1	6.20
Gary,Ind. U5	5.30
Ind.Harb.,Ind. I-2	5.30
IndianaHarbor,Ind. Y1	5.80
Lackawanna,N.Y. B2	4.90
LosAngeles(25) B3	6.05
Seattle B3	6.30
Sharon,Pa. S3	5.40
So.SanFrancisco(25) B3	6.05
SparrowsPoint,Md. B2	4.95
Warren,O. R2	5.30
Weirton,W.Va. W6	5.75
Youngstown Y1	5.80
Youngstown U5	5.30

STRIP, Cold-Rolled Alloy Steel

Bridgeport,Conn.(10) S15	*10.75*
Carnegie,Pa. S18	10.60
Cleveland A7	10.00
Dover,O. G6	10.50
Fontana,Calif. K1	11.65
Harrison,N.J. C18	10.60
NewBritn.,Conn.(10) S15	*10.75*
Pawtucket,R.I.(11) NS	10.75
Pawtucket,R.I.(12) NS	11.05
Sharon,Pa. S3	10.60
Worcester,Mass. A7	10.30
Youngstown C8	10.60

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland A7, J5	6.70
Dover,O. G6	7.30
Ecorse,Mich. G5	6.65
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.55
Weirton,W.Va. W6	7.20
Youngstown Y1	7.05

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.50
Alton,Ill.(1) L1	3.75
Ashland,Ky(8) A10	3.50
Atlanta A11	4.05
Bessemer,Ala. T2	3.50
Bridgeprt,Conn.(10) S15	4.00
Buffalo(27) R2	3.50
Butler,Pa. A10	3.50
Carnegie,Pa. S18	4.00
Conshohocken,Pa. A3	3.30
Detroit M1	4.40
Ecorse,Mich. G6	3.45
Fairfield,Ala. T2	3.50
Fontana,Calif. K1	4.75
Gary,Ind. U5	3.50
Houston,Tex. S5	4.90
Ind.Harbor,Ind. I-2, Y1	3.50
Johnstown,Pa.(25) B2	3.50
KansasCity,Mo.(9) S5	4.10
Lackawanna,N.Y.(32) B2	3.50
LosAngeles B3	4.25
Milton,Pa. B6	4.00
Minnequa,Colo. C10	4.35
NewBritain(10) S15	4.00
N.Tonawanda,N.Y. B11	3.50
Pittsburg,Calif. C11	4.25
Riverdale,Ill. A1	3.50
SanFrancisco S7	4.85
Seattle-B3, N14	4.50
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.50
So. San Francisco B3	4.25
SparrowsPoint,Md. B2	3.50
Torrance,Calif. C11	4.25
Warren,O. R2	3.50
Weirton,W.Va. W6	3.60
WestLeechburg,Pa. A4	3.75
Youngstown U5, Y1	3.50

STRIP, Electro Galvanized

Cleveland A7	4.65
Dover,O. G6	5.50
Warren,O. T5	5.25
Weirton,W.Va. W6	4.65
Youngstown C8	5.25

STRIP, Cold-Finished, Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Beres,O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
Bristol,Conn. W1	...	...	7.70	9.65	...
Carnegie,Pa. S18	...	6.80	7.40	9.35	11.65
Cleveland A7	4.65	6.45	7.40	9.35	11.65
Dearborn,Mich. D3	5.60	7.05	7.65	...	...
Detroit D2	5.60	6.65	7.25	...	...
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
Franklin,Park,Ill. T6	5.09	6.60	7.55	9.50	11.80
Harrison,N.J. C18	...	...	7.70	9.65	11.95
Mattapan,Mass. T6	5.50	6.75	7.70	9.65	11.95
NewBritn.,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
NewCastle,Pa. B4	5.35	6.80	7.40	9.35	...
NewCastle,Pa. E5	5.50	6.80	7.40	9.35	11.65
NewHaven,Conn. D2	5.85	6.75	7.35	...	...
NewYork W3	...	7.10	7.70	9.65	11.95
Pawtucket,R.I. NS:					
Cleve-or-Pitts.Base	...	6.80	7.40	9.35	11.65
Worcester,Base	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5	...	7.10	7.70	9.65	11.95
Wallingford,Conn. W2	5.85	6.75	7.35	9.30	11.60
Weirton,W.Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester,Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown C8	...	6.80	7.40	9.35	11.65

Spring Steel (Tempered)

Trenton,N.J. R5	...	...	10.30	12.80	15.35
Harrison,N.J. C18	...	...	10.30	12.50	15.35
NewYork W3	...	...	10.30	12.50	15.35

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G5	5.50
Berea,O. C7	9.60
Bridgeprt,Conn.(10)	5.35
Butler,Pa. A10	4.65
Cleveland A7, J5	4.65
Dearborn,Mich. D3	5.60
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G6	4.35
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	8.30
FranklinPark,Ill.(40)	4.90
Ind.Harbor,Ind. I-2	4.90
Lackawanna,N.Y. B2	4.65
LosAngeles C1	6.40
Mattapan,Mass. T6	6.50
Middletown,O. A10	4.65
NewBritain(10) S15	5.35
NewCastle,Pa. B4	5.35
NewCastle(40) E5	5.20
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.15
Pawtucket,R.I. R3	6.00
Pawtucket,R.I.(21)	5.85
Riverdale,Ill.(40) A1	4.90
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.35
SparrowsPoint,Md. B2	4.65
Trenton,N.J. R5	6.00
Wallingford,Conn. W2	5.85
Warren,O.(40) T5	5.25
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
WestLeechburg,Pa. A4	4.65
Youngstown C8, (40)	5.25
Youngstown Y1	4.65

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	5.45
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	6.70
Gary,Ind. U5	5.50
Houston,Tex. S5	5.90
KansasCity,Mo. S5	6.10
NewBritn,Conn.(10) S15	5.45
Sharon,Pa. S3	5.85
Youngstown U5	5.50

Key to Producers

A1	Acme Steel Co.
A3	Alan Wood Steel Co.
A4	Allegheny Ludlum Steel
A7	AmericanSteel & Wire
A8	Anchor Drawn Steel Co.
A9	Angell Nail & Chaplet
A10	Armco Steel Corp.
A11	Atlantic Steel Co.
A13	American Cladmetals Co.
B1	Babcock & Wilcox Tube
B2	Bethlehem Steel Co.
B3	Beth. Pac. Coast Steel
B4	Blair Strip Steel Co.
B5	Bliss & Laughlin Inc.
B6	Boiardi Steel Corp.
B8	Braeburn Alloy Steel
B11	Buffalo Bolt Co.
B12	Buffalo Steel Co.
B14	A. M. Byers Co.
C1	Calif. Cold Rolled Steel
C2	Calumet Steel Div., Borg-WarnerCorp.
C4	Carpenter Steel Co.
C5	Central Iron & Steel Div. Barium Steel Corp.
C7	Cleve.Cold Roll.Mills Co.
C8	Cold Metal Products Co.
C9	Colonial Steel Co.
C10	Colorado Fuel & Iron
C11	Columbia Steel Co.
C12	Columbia Steel & Shaft.
C13	Columbia Tool Steel Co.
C14	Compressed Steel Shaft
C16	Continental Steel Corp.
C17	Copperweld Steel Co.
C18	Crucible Steel Co.
C19	Cumberland Steel Co.
C20	Cuyahoga Steel & Wire
D2	Detroit Steel Corp.
D3	Detroit Tube & Steel
D4	Disston & Sons, Henry
D6	Driver Harris Co.
D7	Dickson Weatherproof Nail Co.
E1	Eastern Gas&Fuel Assoc.
E2	Eastern Stainless Steel
E4	Electro-Metallurgical Co.
E5	Elliott Bros. Steel Co.
E6	Empire Steel Corp.
F2	Firth Sterling Steel
F3	Fitzsimons Steel Co.
F4	Follansbee Steel Corp.
F5	Franklin Steel Div., Borg-Warner Corp.
F6	Fretz-Moon Tube Co.
F7	Ft. Howard Steel & Wire
G1	Geneva Steel Co.
G2	Globe Iron Co.
G3	Globe Steel Tubes Co.
G4	Granite City Steel Co.
G5	Great Lakes Steel Corp.
G6	Greer Steel Co.
H1	Hanna Furnace Corp.
H4	Heppenstall Co.
I-1	Igoe Bros. Inc.
I-2	Inland Steel Co.
I-3	Interlake Iron Corp.
I-4	Ingersoll Steel Div., Borg-Warner Corp.
J1	Jackson Iron & Steel Co.
J3	Jessop Steel Co.
J4	Johnson Steel & Wire Co.
J5	Jones & Laughlin Steel
J6	Joslyn Mfg. & Supply
J7	Judson Steel Corp.
J8	Jersey Shore Steel Co.
K1	Kaiser Steel Corp.
K2	Keokuk Electro-Metals
K3	Keystone Drawn Steel
K4	Keystone Steel & Wire
K7	Koppers Co. Inc.
L1	Laclede Steel Co.
L2	LaSalle Steel Co.
L3	Latrobe Electric Steel
L5	Lockhart Iron & Steel
L6	Lone Star Steel Co.
L7	Lukens Steel Co.

STRIP Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.75
Warren,O. R2	4.10

STRIP Cold-Rolled Ingot Iron

Warren,O. R2	5.25

TIGHT COOPERAGE HOOP

Atlanta A11	4.05
Riverdale,Ill. A1	3.90
Sharon,Pa. S3	4.15
Youngstown U5	3.75

WIRE Merchant Quality (6 to 8 gage)

	An'ld	Galv.
AlabamaCity R2	5.70	5.95
Aliquippa J5	5.70	6.15
Atlanta A11	5.95	6.40
Bartonville(19)K4	5.85	6.15
Buffalo W12	4.85	...
Cleveland A7	5.70	6.15
Crawfordsville M8	5.95	6.40
Donora A7	5.70	6.15
Duluth A7	5.70	6.15
Fairfield T2	5.70	6.15
Houston,Tex. S5	6.10	6.55
Johnstown B2	5.70	6.15
Joliet, Ill. A7	5.70	6.15
KansasCy.Mo. S5	6.30	6.75
Kokomo C16	5.80	6.05
LosAngeles B3	6.65	...
Minnequa C10	5.95	6.45
Monessen P7	5.95	6.40
Palmer W12	5.15	...
Pitts.Calif. C11	6.65	6.80
Prtsmth.(18)P12	6.10	6.60
Rankin A7	5.70	6.15
So.Chicago R2	5.70	5.95
So.S.Fran. C10	6.85	7.10
SparrowsPt. B2	5.80	6.25
Sterling,Ill.(1)N15	5.70	6.15
Struthers,O. Y1	5.70	6.15
Torrance,Cal. C11	6.65	...
Worcester A7	6.00	6.45

WIRE (16 gage)	An'ld Stone	Galv. Stone
Aliquippa J5	10.15	11.85
Bartonville(1) K4	10.25	11.95
Cleveland A7	10.25	12.15
Crawfrdsvle M8	10.30	12.00
Fostoria,O. S1	10.40	13.00
Johnstown B2	10.25	12.15
Kokomo C16	10.25	11.95
Minnequa C10	10.40	12.40
Palmer,Mass. W12	10.25	12.15
Pitts.,Cal. C11	10.25	12.15
Prtsmth.(18) P12	10.55	12.30
SparrowsPt. B2	10.35	12.25
Waukegan A7	10.25	12.15

ROPE WIRE	(A)	(B)
Bartonville,Ill. K4	8.55	8.80
Buffalo W12	8.55	8.80
Cleveland A7	8.55	8.80
Donora,Pa. A7	8.55	8.80
Fostoria,O. S1	8.85	9.10
Johnstown,Pa. B2	8.55	8.80
Monessen,Pa. P16	8.55	8.80
Monessen,Pa. P7	8.80	9.05
NewHaven A7	8.85	9.10
Palmer,Mass. W12	8.85	9.10
Portsmouth,O. P12	8.55	8.80
Roebling,N.J. R5	8.85	9.10
SparrowsPt. B2	8.65	8.90
Struthers,O. Y1	8.55	8.80
Trenton,N.J. A7	8.85	9.10
Waukegan,Ill. A7	8.55	8.80
Worcester H	*8.55*	*9.10*
Worcester T6	8.85	9.10

(A) Plow and Mild Plow.
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	4.85
Aliquippa,Pa. J5	4.85
Atlanta A11	5.10
Alton,Ill.(1) L1	4.85
Bartonville,Ill.(1) K4	4.85
Buffalo W12	4.85
Chicago W13	4.85
Cleveland A7, C20	4.85
Crawfordsville,Ind. M8	5.10
Donora,Pa. A7	4.85
Duluth A7	4.85
Fairfield,Ala. T2	4.85
Fostoria,O.(24) S1	5.35
Houston S6	5.25
Johnstown,Pa. B2	4.85
Joliet,Ill. A7	4.85
KansasCity,Mo. S5	5.45
Kokomo,Ind. C16	4.95
LosAngeles B3	5.80
Minnequa,Colo. C10	5.10
Monessen,Pa. P7	5.10
Newark, 6-8ga. I-1	5.50
No. Tonawanda B11	4.85
Palmer,Mass. W12	5.15
Pittsburg,Calif. C11	5.80
Portsmouth,O. P12	5.25
Rankin,Pa. A7	4.85
So.Chicago,Ill. R2	4.85
So.SanFrancisco C10	5.80
SparrowsPoint,Md. B2	4.85
Struthers,O. Y1	4.85
Torrance,Calif. C11	5.80
Waukegan,Ill. A7	4.85
Worcester,Mass. A7, T6	5.15

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	6.20
Buffalo W12	6.35
Cleveland A7	5.85
Crawfordsville,Ind. M8	6.20
Detroit D2	6.20
Dover,O. G6	6.20
Fostoria,O. S1	6.00
Kokomo,Ind. C16	5.70
FranklinPark,Ill. T6	6.20
Massillon,O. R8	5.85
Monessen,Pa. P16	5.85
Monessen,Pa. P7	6.10
NewHaven,Conn. D2	6.50
Pawtucket,R.I.(12) N8	6.85
Trenton,N.J. R5	6.15
Worcester A7	6.00
Worcester T6	6.50
Worcester W12	6.65

WIRE, Fine & Weaving (8" Coils)

Bartonville,Ill.(1) K4	8.80
Buffalo W12	8.90
Chicago W13	8.90
Cleveland A7	8.90
Crawfordsville,Ind. M8	8.95
Fostoria,O. S1	8.80
Johnstown,Pa. B2	8.90
Kokomo,Ind. C16	8.80
Monessen,Pa. P16	8.80
Palmer,Mass. W12	9.20
Portsmouth,O. P12	8.90
Roebling,N.J. R5	9.20
Waukegan,Ill. A7	8.80
Worcester,Mass. A7, T6	9.20

WIRE, Galv'd ACSR for Cores

Bartonville,Ill K4	8.50
Monessen,Pa. P16	8.50
Roebling,N.J. R5	8.80
SparrowsPoint,Md. B2	8.25

WIRE, Tire Bead

Bartonville,Ill.(1) K4	10.90
Monessen,Pa. P16	11.40
Roebling,N.J. R5	11.55

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	6.25
Alton,Ill.(1) L1	6.25
Bartonville,Ill.(1) K4	6.25
Buffalo W12	6.25
Cleveland A7	6.25
Donora,Pa. A7	6.25
Duluth A7	6.25
Fostoria,O. S1	6.25
Johnstown,Pa. B2	6.25
LosAngeles B3	7.20
Milbury,Mass.(12) N6	8.05
Monessen,Pa. P7, P16	6.25
Palmer,Mass. W12	6.55
Pittsburg,Calif. C11	7.20
Roebling, N.J. R5	6.55
Portsmouth,O. P12	6.25
So.Chicago,Ill. R2	6.25
So.SanFrancisco C10	6.85
SparrowsPoint,Md. B2	6.35
Struthers,O. Y1	6.25
Trenton,N.J. A7	6.55
Waukegan,Ill. A7	6.25
Worcester A7, T6, W12	6.55
Worcester,Mass. H	*6.75*

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.40
Alton,Ill.(1) L1	5.90
Buffalo W12	5.90
Cleveland A7	5.90
Donora,Pa. A7	5.90
Duluth A7	5.90
Johnstown,Pa. B2	5.90
LosAngeles B3	6.85
Monessen,Pa. P7, P16	5.90
NewHaven,Conn. A7	6.20
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	6.85
Portsmouth,O. P12	5.90
Roebling,N.J. R5	6.20
So.Chicago,Ill. R2	5.90
SparrowsPoint,Md. B2	6.00
Torrance,Calif. C11	6.85
Trenton,N.J. A7	6.20
Waukegan,Ill. A7	5.90
Worcester,Mass. A7	6.20

WOVEN FENCE, 9-15½ Ga. Col

AlabamaCity,Ala. R2	126
Ala.City,Ala. 17-15ga.R2	213
Aliquippa,Pa.9-14½ga.J6	130
Atlanta A11	133
Bartonville,Ill.(19) K4	130
Crawfordsville,Ind. M8	132
Donora,Pa. A7	130
Duluth A7	130
Houston,Tex. S5	138
Fairfield,Ala. T2	130
Johnstown,Pa. B2	130
Johnstown,17ga.,6" B2	204
Johnstown,17ga.,4" B2	207
Joliet,Ill. A7	130
KansasCity,Mo. S5	142
Kokomo,Ind. C16	132
Minnequa,Colo. C10	138
Monessen,Pa. P7	135
Pittsburg,Calif. C11	153
Portsmouth,O.(18) P12	137
Rankin,Pa. A7	130
So.Chicago,Ill. R2	126
Sterling,Ill.(1) N15	130

FENCE POSTS Col.

ChicagoHts.,Ill. C2	140
Duluth A7	125
Franklin,Pa. F5	140
Huntington,W.Va. W7	140
Johnstown,Pa. B2	140
Marion,O. P11	140
Minnequa,Colo. C10	130
Moline,Ill. R2	136
So.Chicago R2	140
Tonawanda B12	140
Williamsport,Pa. S19	150

WIRE, Barbed Col.

AlabamaCity,Ala. R2	136
Aliquippa,Pa. J5	140
Atlanta A11	143
Bartonville,Ill.(19) K4	143
Crawfordsville M8	143
Donora,Pa. A7	140
Duluth, Minn. A7	140
Fairfield,Ala. T2	140
Houston,Tex. S5	148
Johnstown,Pa. B2	140
Joliet,Ill. A7	140
KansasCity,Mo. S5	152
Kokomo,Ind C16	142
Minnequa,Colo. C10	146
Monessen,Pa. P7	140
Pittsburg,Calif. C11	160
Portsmouth,O.(18) P12	147
Rankin,Pa. A7	140
So.Chicago,Ill. R2	136
So.SanFran.,Calif. C10	160
SparrowsPoint,Md. B2	142
Sterling,Ill.(1) N15	140

BALE TIES, Single Loop Col.

AlabamaCity,Ala. R2	123
Atlanta A11	126
Bartonville,Ill.(19) K4	123
Chicago W13	123
Crawfordsville M8	132
Donora,Pa. A7	123
Duluth A7	123
Fairfield,Ala. T2	123
Joliet,Ill. A7	123
KansasCity,Mo. S5	135
Kokomo,Ind. C16	125
Minnequa,Colo. C10	128
Pittsburg,Calif. C11	147
So.Chicago,Ill. R2	123
So.SanFran.,Calif. C10	147
SparrowsPoint,Md. B2	125
Sterling,Ill.(1) N15	123

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2	6.10
Bartonville,Ill.(19) K4	5.95
Crawfordsville,Ind. M8	6.30
Donora,Pa. A7	5.95
Duluth A7	5.95
Johnstown,Pa. B2	5.95
Joliet,Ill. A7	5.95
Kokomo,Ind. C16	6.05
Minnequa,Colo. C10	6.20
Pittsburgh,Calif. C11	6.90
Portsmouth,O. P12	6.25
Rankin,Pa. A7	5.95
So.Chicago,Ill. R2	6.10
SparrowsPoint,Md. B2	6.05
Sterling,Ill.(1) N15	6.65
Worcester,Mass. A7	6.25

NAILS, Cut (100 lb keg) To dealers (33)

Conshohocken,Pa. A3	$7.35
Wheeling,W.Va. W10	7.15

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	TeeRails 60 lb Under
Bessemer,Pa. U5	3.60	3.50	3.55	4.00
Ensley,Ala. T2	3.60	3.50	...	4.00
Fairfield,Ala. T2	...	...	...	4.00
Gary,Ind. U5	3.60	3.50	3.55	...
Huntington,W.Va. W7	...	...	...	5.00
Ind.Harbor,Ind. I-2	3.60	3.50	3.55	...
Johnstown,Pa. B2	...	...	...(16)	4.00
Lackawanna B2	3.60	3.50	...	4.00
Minnequa,Colo. C10	3.60	3.50	...	4.50
Steelton,Pa. B2	3.60	3.50	...	...
Williamsport,Pa. S19	...	...	...	4.75

NAILS & STAPLES, Stock to dealers & mfrs. (7)

	Col.
AlabamaCity,Ala. R2	118
Aliquippa,Pa.(13) J5	118
Atlanta A11	121
Bartonville,Ill.(19) K4	118
Chicago Ill. W13	130
Cleveland A9	125
Crawfordsville,Ind. M8	122
Donora,Pa. A7	118
Duluth A7	118
Fairfield,Ala. T2	118
Galveston,Tex. D7	126
Houston,Tex. S5	126
Johnstown,Pa. B2	118
Joliet,Ill. A7	118
KansasCity,Mo. S5	130
Kokomo,Ind. C16	120
Minnequa,Colo. C10	123
Monessen,Pa. P7	124
Pittsburg,Calif. C11	137
Portsmouth,O. P12	124
Rankin,Pa. A7	118
So.Chicago,Ill. R2	118
SparrowsPoint,Md. B2	120
Sterling,Ill.(1) N15	118
Torrance,Calif. C11	138
Worcester,Mass. A7	124

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	6.15
KansasCity,Mo. S5	6.40
Lebanon,Pa. B2	6.15
Minnequa,Colo. C10	6.15
Pittsburgh J5	6.15
Seattle B3	6.65
So.Chicago,Ill. R2	6.15
Struthers,O. Y1	6.15
Youngstown R2	6.15

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.85
Lebanon,Pa.(32) B2	9.85
Minnequa,Colo. C10	9.85
Pittsburgh O3, P14	9.85
Seattle B3	10.40

TIE PLATES

Fairfield,Ala. T2	4.50
Gary,Ind. U5	4.50
Ind.Harbor,Ind. I-2	4.50
Lackawanna,N.Y. B2	4.50
Minnequa,Colo. C10	4.50
Pittsburg,Calif. C11	4.65
Seattle B3	4.65
Steelton,Pa. B2	4.50
Torrance,Calif. C11	4.65

JOINT BARS

Bessemer,Pa. U5	4.70
Fairfield,Ala. T2	4.70
Ind.Harbor,Ind. I-2	4.70
Joliet,Ill. U5	4.70
Lackawanna,N.Y. B2	4.70
Minnequa,Colo. C10	4.70
Steelton,Pa. B2	4.70

AXLES

Ind.Harbor,Ind. S13	5.60
Johnstown,Pa. B2	5.60

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Co.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwst. Steel Roll.Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts.Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island SteelCorp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield,S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.

U1 Ulster Iron Works
U4 Universal Cyclops Steel
U5 United States Steel Co.

V2 Vanadium Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Corp.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg.Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W16 Worth Steel Co.
W18 Wyckoff Steel Co.

Y1 Youngston Sheet&Tube

TOOL STEELS

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	23.00	13.5W,4Cr,3V	140.00
Extra Carbon	27.00	18W,4Cr,2V,9Co	217.50
Spec. Carbon	32.50	19W,4Cr,2V,7Co	217.50
Oil Hardening	35.00	18.25W,4.25Cr,1V,4.75Co	185.50
Cr Hot Wrk	35.00	20.25W,4.25Cr,1.6V,12.25Co	323.00
Hi-Carbon-Cr	63.50	1.5W,4Cr,1V,8.5Mo	78.50
18W,4Cr,1V	123.50	6.4W,4.5Cr,1.9V,5Mo	87.00
18W,4Cr,2V	138.00	6W,4Cr,3V,6Mo	109.50

Tool steel producers include: A4, A8, B2, B8, C4, C8, C13, C18, D4, F2, H4, J3, L3, M14, S8, U4, V2, V3.

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 5 cents lower.
(8) 16 gage and heavier.
(9) 18 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pittsburgh base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(14) Also wide flange beams.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. base.
(22) Del San Fran. Bay area.
(23) 28 Ga., 26" wide.
(24) Deduct 0.20c finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, to fabricators (elec. furn. billet, 5.40c); to consumers, 6.15c.
(27) Bar mill sizes.
(28) Reinforced.
(29) Subject to 10% increase.
(30) Sheared; add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. edge or square edge.
(33) To jobbers, deduct 20 cents.
(34) 7.25c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 16 gage & lighter; 60" & narrower.
(38) 14 gage & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.

UNIVERSITY OF MICHIGAN LIBRARIES

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	34.0	32.0	29.0	+5.5	+0.5	+3.5
¼	6.0	0.42	28.5	26.5	23.5	+1.0	+3.0	+6.0
⅜	6.0	0.57	23.5	21.5	18.5	+7.0	+9.0	+12.0
½	8.5	0.85	36.0	34.0	35.0	14.0	12.0	13.0
¾	11.5	1.13	39.0	37.0	38.0	18.0	16.0	17.0
1	17.0	1.68	41.5	39.5	40.5	21.5	19.5	20.5
1¼	23.0	2.28	42.0	44.0	41.0	22.0	24.0	21.0
1½	27.5	2.78	42.5	41.5	41.6	23.0	21.5	22.0
2	37	3.68	43.0	41.0	42.0	23.5	21.5	22.5
2½	58.5	5.82	43.5	41.5	42.5	24.0	22.0	23.0
3	76.5	7.62	43.5	41.5	42.5	24.0	22.0	23.0

Column A: Etna, Pa. N2; Butler, Pa. ⅛-¾", F6; Benwood, W. Va., 3½ points lower on ⅛", 1½ points lower on ¼", and 2 points lower on ⅜". W10; Sharon, Pa. M6, 1 point higher on ⅛", 2 points lower on ¼" and ⅜"; following make ½" *and larger*: Lorain, O., N3; Youngstown R2 and 36½% on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5, Fontana, Calif. K1 quotes 11½ points lower on ½" *and larger continuous* weld and 24% on 3½" and 4". Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., ½" through 3", Y1; Alton, Ill. (Gary base) I1.

Column D: Butler, Pa. F6, ¼-⅜"; Benwood, W. Va. W10, except plus 3½% on ⅛", plus 2½% on ¼", plus 9% on ⅜"; Sharon, Pa. M6, plus 0.5 on ¼", 1 point lower on ⅜", ½", ¾", 1½ points lower on 1" and 1¼", 2 points lower on 1½", 2", 2½" and 3". Following quote only on ½" and larger: Lorain, O. N3; Youngstown R2, and 16½% on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5 quotes 1 point lower on ¾", 2 points lower on 1", 1½ points lower on 1¼", 2 points lower on 1½" and 2", 1½ points lower on 2½" and 3"; Etna, Pa. N2 and 18½% on 3½" and 4".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	29.5	9.5	29.5	9.5
2½	58.5	5.82	32.5	12.5	32.5	12.5
3	76.5	7.62	32.5	12.5	32.5	12.5
3½	92.0	9.20	34.5	14.5	34.5	14.5
4	$1.09	10.89	34.5	14.5	34.5	14.5
5	1.48	14.81	37.0	17.0	37.0	17.0
6	1.92	19.18	37.0	17.0	37.0	17.0

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 1½ pts lower on 2", 1 pt lower on 2½-6 in.; Lorain, N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	13.45	16.47	15.36	15.36
1¼	13	16.09	19.71	15.61	18.19
1½	13	17.27	21.15	17.25	20.30
1¾	13	19.29	23.62	19.62	23.09
2	13	21.62	26.48	21.99	25.86
2¼	13	24.35	29.82	24.50	28.84
2¼	12	26.92	32.97	26.98	31.76
2½	12	29.65	36.32	29.57	34.76
2¾	12	32.11	39.33	31.33	36.84
3	12	34.00	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding Stainless	Plates 10%	Plates 20%	Strip Cold-Rolled Carbon Base 10%	Strip Cold-Rolled Carbon Base 20%	Sheets Carbon Base 10%	Sheets Carbon Base 20%	Sheets Cu Base Both Sides
302	....	....	....	....	19.75	27.50	77.00
304	25.00	28.00	....	....	20.75– 24.50	27.50	77.00
		29.50					
309	30.50	35.00	....	....	....	....	....
310	36.50	41.00	....	....	....	....	144.00
316	29.50	31.50– 34.00	....	....	26.00	36.50	....
317	34.50	39.00	....	....	....	....	....
318	33.50	38.00	....	....	....	....	....
321	26.50	31.00	....	....	23.00	33.00	111.00
347	27.50	30.50– 32.00	....	....	24.00	33.50	130.00
405	21.25	27.75	....	....	....	....	....
410	20.75	27.25	....	....	....	....	....
Nickel	33.25	44.25	41.00	54.00	....	....	....
Inconel	41.00	53.50	....	....	....	....	165.00
Monel	34.75	45.75	....	....	....	....	....
Copper*	....	....	23.70†	29.65‡	....	....	....

* Deoxidized. † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. W16, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, monel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:
- ½-in. & smaller diam. 15
- ⅝-in. & ¾-in. 18.5
- ⅞-in. and larger 17.5

Longer than 6 in.: All diams. 14

Lag bolts, all diams.: 6 in. and shorter 23; over 6 in. long 21

Ribbed Necked Carriage 26

Blank 34

Plow 34

Step, Elevator, Tap, and Sleigh Shoe 21

Tire bolts 12

Boiler & Fitting-Up bolts 31

NUTS

	Reg.	Heavy
H.P. & C.P. Square:		
½-in. & smaller	15	15
⅝-in. & ¾-in.	12	6.5
⅞-in.-1½-in.	9	1
1⅝ in. & larger	7.5	1
H.R. Hex.:		
½-in. & smaller	26	22
⅝-in. & ¾-in.	16.5	6.5
⅞-in.-1½-in.	12	2
1⅝ in. & larger	8.5	2
C.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ¾-in.	23	17.5
⅞-in. & 1½-in.	19.5	12
1⅝-in. & larger	12	6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Reg.	Hvy.
½-in. & smaller	35	28.5
⅝-in. & ¾-in.	29.5	22
⅞-in.-1½-in.	24	15
1⅝-in. & larger	13	8.5
		Light
¼-in. & smaller		35
⅜-in. to ¾-in.		28.5
⅞-in. to 1½-in.		26

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish .....56" & 10

Plated finishes....41 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:
- ⅝-in. & smaller 47
- ¾-in. through 1 in. 40

Longer than 6 in.:
- ⅝-in. & smaller 33
- ¾-in. through 1 in. 18

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter 44

1 in. and smaller diam. x over 6 in. 33

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller 41

¼-in. diam. & larger .. 24

N.F. thread, all diams.. 18

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger 7.85c

⅞-in. under ..... 36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ....List to 50c off

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Inches Diam.	Inches Length	Cents per lb
17,18,20	60,72	17.00
8 to 16	48,60,72	17.00
7	48,60	18.64
6	48,60	19.95
4,5⅛	40	20.48
3	40	21.53
2½	24,30	22.05
2	24,30	24.15

CARBON

40	100,110	7.65
35	100,110	7.65
30	84,110	7.65
24	72 to 104	7.65
17 to 20	34,90	7.65
14	60,72	8.16
10,12	60	8.42

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301...	41.00	34.00	31.25
302...	41.00	36.50	31.25
303...	43.00	40.00	33.75
304...	43.00	38.50	32.75
309...	55.50	54.50	44.25
316...	56.50	58.50	48.75
321...	49.00	48.00	36.75
347...	53.50	52.00	41.25
410...	36.50	30.50	25.75
416...	37.00	37.00	26.25
420...	44.00	47.00	31.25
430...	39.00	31.00	26.25
501...	27.50	26.00	14.25
502...	28.50	27.00	15.25

Baltimore, Types 301 through 347 sheet, except 309: E2.

Brackenridge, Pa., sheets A4.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502 A10.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502, S18.

Cleveland, strip A7.

Detroit, strip, except Types 309, 321, 416, 420, 501 and 502 M1.

Dunkirk, N.Y., bars, wire A4.

Duquesne, Pa., bars U5.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip C18.

McKeesport, Pa., bars, sheets except Type 416 U5.

McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Pittsburgh, sheets C18.

Reading, Pa., bars and strip, except 55.50c for Type 309 strip and 44.75c for Type 309 bars, C4.

Sharon, Pa., strip, except Types 303, 309, 316, 416, 501 and 502 S3.

So. Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars, U4.

Wallingford, Conn., strip, except 309, W2 quotes 0.25 cents higher.

Washington, Pa., bars, sheets & strip, except Type 309 sheets 56.00c and bars 44.75c, J3.

Washington, Pa., Types 301 through 347 sheets & strip as listed except 303 & 309; 316 sheets 61.50c, strip 63.00c, W4.

Watervliet, N. Y., structurals & bars A4.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4.

Youngstown, strip, except Types 303, 309, 316, 416, 501 and 502 C8.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol 30.00-35.00

Toluol, one deg. ..26.00-33.00

Industrial xylol ..25.00-33.50

Per ton bulk, ovens

Sulphate of ammonia $32-$45

Cents per pound, ovens

Phenol, 40 (carlots, non-returnable drums) ..17.25

Do., less than carlots..18.00

Do., tank cars 15.50

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70%, $43; 60%, $40.

Imported, net ton, duty paid, metallurgical grade, $33-$35.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for 100 mesh, except as otherwise noted.)

Sponge iron: Cents
- 98 + % Fe, carlots 16.00
- Swedish, c.i.f. New York, in bags ..7.00-8.50

Electrolytic Iron:
- Annealed, 99.5% Fe 42.50
- Unannealed, 99 + % Fe 36.50
- Unannealed, 99 + % Fe minus 325 mesh 58.50

Powder Flakes 48.50

Carbonyl Iron:
- 97.9-99.8%, size 5 to 10 microns..83.00-148.00

Aluminum:
- Carlots, freight allowed 29.50
- Atomized, 500 lb drums, freight allowed 33.50

Brass, 10-ton lots 30.00-33.25

Copper:
- Electrolytic 37.50
- Reduced 38.75-47.00

Lead 25.50

Manganese:
- Minus 100-mesh 57.00
- Minus 35 mesh 52.00
- Minus 200 mesh 62.00

Nickel unannealed 83.00

Nickel-Silver, 10-ton lots 44.00

Silicon 38.50

Solder (plus cost of metal) 8.50

Stainless Steel, 302 ..... $1.25

Tin $1.65

Zinc, 10-ton lots..23.00-30.50

Tungsten: Dollars
- 99%, minus 80 to 200 mesh, freight allowed: over 1000 lb 2.50
- 1000 lb 2.55
- Less than 1000 lb 3.00
- 98.8% minus 65 mesh, freight allowed: 1000 lb. and over.. 4.15
- less than 1000 lb.. 4.25

Molybdenum:
- 99%, minus 80 to 200 mesh, over 500 lb 2.85
- 200 to 500 lb 3.10
- less than 200 lb 3.25

Chromium, electrolytic 99% Cr min. 3.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connellsvll.fur. ..$14.50-15.00

Connellsvll,fdry. ..17.00-18.00

New River, foundry .. 19.50

Wise county, foundry..15.95

Wise county, furnace..15.20

OVEN FOUNDRY COKE

Kearney, N. J., ovens $22.75

Everett, Mass., ovens
- New England, del. ..24.80

Chicago, ovens 21.00
- Chicago, del. 22.45
- Detroit, del. 24.81

Terre Haute, ovens.. 22.50

Milwaukee, ovens 23.75

Indianapolis, ovens 22.75
- Chicago, del. 26.62
- Cincinnati, del. 23.65
- Detroit, del. 26.65

Ironton, O., ovens 21.50
- Cincinnati, del. 24.06

Painesville, O., ovens.. 24.00
- Buffao, del. 26.12
- Cleveland, del. 25.72

Erie, Pa., ovens 23.50

Birmingham, ovens 20.30
- Birmingham, del. 21.69

Philadelphia, ovens 22.70

Neville Island, Pa., ovens 23.00

Swedeland, Pa., ovens 22.00

St. Louis, ovens 24.25
- St. Louis, del. 25.38

Portsmouth, O., ovens 21.50
- Cincinnati, del. 24.06

Detroit, ovens 24.00
- Detroit, del. *25.00
- Buffalo, del. 27.04
- Flint, del. 26.44
- Pontiac, del. 25.39
- Saginaw, del. 26.75

Includes representative switching charge of: *, $1.00; †, $1.45, one-track charge being $1.20, two tracks $1.40, and three or more tracks $1.50. ‡ Or within $4.15 freight zone from works.

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§		Carbon	Floor
New York (city)	6.27	7.29	8.44	6.59	...	6.42	7.29	9.25	6.40	6.58	8.04
New York(c'try)	5.97	6.99	8.14	6.29	...	6.12	6.99	8.95	6.10	6.28	7.74
Boston (city) ..	6.40	7.20	8.49	6.35	...	6.25	7.04	9.25	6.40	6.98	7.88
Boston (c'try) .	6.20	7.00	8.29	6.15	...	6.05	6.84	9.05	6.20	6.78	7.68
Phila. (city) ..	7.15	7.05	8.25	6.35	...	6.30	7.11	8.90	6.15	6.30	7.40
Phila. (c'try) ..	6.90	6.80	8.00	6.10	...	6.05	6.86	8.65	5.90	6.05	7.15
Balt. (city) ...	5.80	7.04	8.27	6.24	...	6.24	7.09	...	6.34	6.00	7.64
Balt. (c'try) ...	5.60	6.84	8.07	6.04	...	6.04	6.89	...	6.14	5.80	7.44
Norfolk, Va. ..	6.50	...	...	6.70	...	6.55	7.70	...	6.60	6.50	8.00
Richmond, Va. .	5.90	...	8.10	6.10	...	6.10	6.90	...	6.30	6.05	7.80
Wash. (w'hse) .	6.02	7.26	8.49	6.46	...	6.46	7.26	...	6.56	6.22	7.86
Buffalo (del.) ..	5.80	6.60	8.29	6.06	...	5.80	6.65	10.65††§	6.00	6.25	7.55
Buffalo (w'hse).	5.60	6.40	8.09	5.86	...	5.60	6.45	10.45††§	5.80	6.05	7.35
Pitts. (w'hse) ..	5.60	6.40*	7.75	5.65-5.95	6.90	5.55	6.40	10.10††	5.70	5.75	7.00
Detroit (w'hse).	5.45-5.78	6.53-6.80	7.99	5.94-5.95	7.75	5.84	6.56	8.91	6.09	6.19-6.35	7.28
Cleveland (del.)	5.80	6.60	8.30	5.89	7.10	5.77	6.60-6.70	8.91	10.02	6.12	7.32
Cleve. (w'hse) .	5.60	6.40	8.10	5.69	6.90	5.57	6.40-6.50	8.71	5.82	5.92	7.12
Cincin. (city) ..	6.02	6.59	7.34	5.95	...	5.95	6.51	...	6.24	6.34	7.50
Chicago (city) .	5.80	6.60	7.95	5.75	...	5.75	6.50	10.30	5.90	6.00	7.20
Chicago (w'hse)	5.60	6.40	7.75	5.55	...	5.55	6.30	10.10	5.70	5.80	7.00
Milwaukee (city)	5.94	6.74	8.09	5.89	...	5.89	6.74	10.44	6.04	6.14	7.34
Milwau. (c'try) .	5.74	6.54	7.89	5.69	...	5.69	6.54	10.24	5.84	5.94	7.14
St. Louis (del.).	5.68	6.48	7.28	5.63	...	5.63	6.28	10.08††§	5.78	5.93	7.13
St. L. (w'hse) .	5.48	6.28	7.08	5.43	...	5.43	6.08	9.88††§	5.58	5.73	6.93
Kans. City(city)	6.40	7.20	8.40	6.35	...	6.35	7.20	...	6.50	6.60	7.80
KansCity(w'hse)	6.20	7.00	8.20	6.15	...	6.15	7.00	...	6.30	6.40	7.60
Omaha, Nebr. ..	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Birm'hm (city) .	5.75	6.55	6.90²	5.70	...	5.70	7.53	...	5.85	6.10	8.25
Birm'hm (w'hse)	5.60	6.40	6.75²	5.55	...	5.55	7.53	...	5.70	5.95	8.23
Los Ang. (city)	6.55	8.10	9.05³	6.60	8.90	6.55	7.75	...	6.55	6.60	9.20
L. A. (w'hse) ..	6.35	7.90	8.85³	6.40	8.70	6.35	7.55	...	6.35	6.40	8.70
San Francisco..	6.65	7.80⁴	8.90³	6.60	...	6.45	8.20	...	6.45	6.50	8.60
Seattle-Tacoma .	7.05	8.60⁴	9.20³	7.30	...	6.75	9.10	11.15	6.65	6.75	8.80

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; ²—500 to 1499 lb; ³—450 to 1499 lb; ⁴—3500 lb and over; ⁵—1000 to 1999 lb.

REFRACTORIES

(Prices per 1000 bricks, f.o.b. plant)

FIRE CLAY BRICK

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Hayward, Ashland, Ky., Clearfield, Curwensville, Pa., Ottawa, Ill., $116.60. Hard-fired, St. Louis, Vandalia, Mo., Olive Hill, Ky., $156.20.

High-Heat Duty: Salina, Pa. $99.60 Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, Curwensville, Lumber, Lockhaven, Pa., Olive Hill, Hitchins, Haldeman, Ashland, Ky., Troup, Athens, Tex., Stevens Pottery, Ga., Bessemer, Ala., Portsmouth, Oak Hill, O., Ottawa, Ill., $94.60.

Intermediate-Heat Duty: St. Louis, Farber, Vandalia, Mo., West Decatur, Orviston, Beach Creek, Curwensville, Lumber, Lockhaven, St. Marys, Clearfield, Pa., Olive Hill, Hitchins, Haldeman, Ashland, Hayward, Ky., Athens, Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $88; Bessemer, Ala., $79.20.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., $79.20; Parral, O., $78.50; St. Marys, Pa., $76; Ottawa, Ill., $70.

LADLE BRICK

Dry Press: Chester, New Cumberland, W. Va., Freeport, Merill Station, Clearfield, Pa., Irondale, Wellsville, O. $66.

Wire Cut: Chester, Wellsville, O., $64.

MALLEABLE BUNG BRICK

St. Louis, Vandalia, Farber, Mo., Olive Hill, Ky., $105.60; Beach Creek, Pa., $94.60; Ottawa, Ill., $90.

SILICA BRICK

Mt. Union, Claysburg, or Sproul, Pa., Portsmouth, O., Ensley, Ala., $94.60; Hays, Pa., $100.10; Joliet, Rockdale, Ill., E. Chicago, Ind., $104.50; Lehi, Utah, Los Angeles, $111.10.

Eastern Silica Coke Oven Shapes (net ton): Claysburg, Mt. Union, Sproul, Pa., Birmingham, $92.40.

Illinois Silica Coke Oven Shapes (net ton): Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $93.50.

BASIC BRICK

Per net ton, Baltimore or Chester, Pa. Burned chrome brick, $73-$78; chemical-bonded chrome brick, $77-$82; magnesite brick, $99-$104; chemical-bonded magnesite, $88-$93.

MAGNESITE

Per net ton, Chewelah, Wash. Domestic deadburned, ¾" grains; bulk, $36.30; single paper bags, $41.80.

DOLOMITE

Per net ton. Domestic, burned bulk; Bonne Terre, Mo., $12.15; Martin, Millersville, Narlo, Clay Center, Woodville, Gibsonburg, Bettsville, O., Billmeyer, Plymouth Meeting, Blue Bell, Williams, Pa., Millville, W. Va., $13.

ORES

LAKE SUPERIOR IRON ORE

Gross ton, 51½% (natural), lower lake ports.

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950 in applicable lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

EASTERN LOCAL ORE

Cents per unit, del. E. Pa.

Foundry and basic 56.62% concentrates contract	17.00

FOREIGN ORE

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematites	15.75
Brazilian iron ore, 68-69%	18.00

TUNGSTEN ORE

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$38-$39
Domestic scheelite, del.	nominal

MANGANESE ORE

Long term contracts, nominal; nearby, 48%, duty paid, 79.8c-81.5c per long ton unit, c.i.f. U. S. ports; prices on lower grades adjusted to manganese content and impurities.

CHROME ORE

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00
South African Transvaal	
44% no ratio	$19.50
45% no ratio	20.00
48% no ratio	27.00
50% no ratio	28.00-28.50
Brazilian	
44% 2.5:1 lump	$32.00
Rhodesian	
45% no ratio	$20.00-21.00
48% no ratio	26.00
48% 3:1 lump	35.00-36.00
Domestic—rail nearest seller	
48% 3:1	$39.00

MOLYBDENUM

Sulphide concentrates per lb, molybdenum content, mines	$0.90

FERROALLOYS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $75, Palmerton, Pa.; $75, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $185 per gross ton of alloy, c.l. packed, $197, gross ton lots, packed, $212; less gross ton lots, packed, $229; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., Welland, Ont., or Ashtabula, O. Base price: $187, Johnstown, Pa.; $185, Sheridan, Pa.; $188, Etna, Pa.; $190, Chattanooga, Tenn. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, Oakland, Portland, Oreg. Shipment from Chicago warehouse, ton lots $227; less gross ton lots, $244 f.o.b. Chicago. Add or subtract $2.30 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 25.75c per lb of contained Mn, carload packed 26.5c, ton lot 27.6c, less ton 28.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max. 7% Si. **Special Grade:** (Mn 90% min., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max.). Carload, lump, bulk 19.15c per lb of contained Mn, carload packed 19.9c, ton lot 21.0c, less ton 22.2c. Delivered. Spot, add 0.25c.

Manganese Metal, 2" x D (Mn 96% min., Fe 2% max., Si 1% max., C 0.2% max.): Carload lump bulk, 34c per lb of metal, packed, 34.75c; ton lot 36.25c; less ton lot 38.25c. Delivered. Spot, add 2c.

Manganese, Electrolytic: 250 lb to 1999 lb, 32c; 2000 to 39,999 lb, 30c; 40,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump bulk, 1.50% C grade, 18-20% Si 9.90c per lb of alloy, carload packed, 10.65c, ton lot 11.55c, less ton 12.55c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2 from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 21.75c per lb of contained Cr, c.l., packed 22.65c, ton lot 23.80c, less ton 25.20c. Delivered. Spot, add 0.25c.

"SM" Ferrochrome: (Cr 60-65% Si 4-6%, Mn

(Please turn to page 122)

UNIVERSITY OF MICHIGAN LIBRARIES

Restrictions Tighten on Metals

Stringency of supplies forces government to ban use of aluminum, nickel and other strategic metals in more products. Tin and antimony prices rise

New York Nonferrous metal consumers are more concerned about supplies, rather than prices. Restrictions on uses are being tightened steadily by the government, forcing many plants to search for substitute materials. Others are converting their operations to war work on which rated orders apply.

National Production Authority issued an order last week providing that the secretary of defense may reschedule delivery of aluminum forms and products which are used to make aircraft and guided missiles. The order may not be used to alter the aluminum companies' production schedules but only to change deliveries. Only priority-rated defense orders may be affected.

Prices of domestically produced copper, lead and zinc are not expected to be affected by the "freeze" order since they have held unchanged for many weeks. Antimony prices rose 10 cents a pound last week and may be adjusted under the pending order. A central purchasing arrangement may be set up between affected countries to control the market for metals in international trade. The need for such a program is particularly acute in tin which is selling at an all-time high as result of international competition.

Sherritt-Gordon Nickel Co., Toronto, Ont., has received a letter of commitment from General Services Administration, Washington, to purchase nickel. GSA is the purchasing agent for the Munitions Board. Sherritt-Gordon will expand some of its facilities to take care of the added business.

Executives of American mining firms met last week in Chile with the President of that country to facilitate the movement of copper to the United States. The Chilean Congress and press are debating what means the Chilean government can provide to aid the tight copper situation in America and Europe, along with what possible benefits Chile may get.

United States production of refined copper increased to 109,464 tons in December while deliveries to fabricators amounted to 121,954 tons. Refined stocks dropped to only 49,040 tons at the monthend compared with 116,027 tons on Jan. 1.

Zinc The government is expected to ban the use of zinc in nonessential products and allocations of the metal loom as a possibility. Zinc is considered to be in shortest supply of all the major nonferrous metals.

The question of supplies in 1951 is difficult to forecast, said Ernest V. Gent, executive vice president, American Zinc Institute Inc., New York. "The shortage of concentrates and scrap to feed the smelters and refineries is the main limiting factor (to increased production), but not the only one," he said. "These raw materials . . . can only be increased by long-range planning and with the necessary inducements to attract the vital risk capital essential to the development and extraction of known reserves and the search for new deposits. At the moment, estimates for 1951 indicate an increase from domestic mines from 617,000 tons to between 660,000 and 690,000 tons, not enough to fill the gap."

Use of Nickel Restricted

Washington — National Production Authority prohibits the use of nickel in a long list of nonessential items. The order lists a wide range of products in which nickel-silver or nickel plate may not be used, beginning Mar. 1 and another list of items in which nickel bearing stainless steel or high-content nickel alloys may not be used, beginning Apr. 1.

Items covered by the order include clad bumpers, grills, hub caps, decorative trim, roofing, cabinets, automatic vending machines, jewelry, water coolers, hand tools, flat ware, toys, and sporting goods. In many instances, manufacturers of these and other affected items will be able to substitute other less critical materials.

This order supplements an earlier NPA action which limits nondefense consumption of nickel during the first quarter to 65 per cent of the average quarterly use during the first half of 1950.

Chromium Mining Boosts Output

Sault Ste. Marie, Ont.—Chromium Mining & Smelting Co. Ltd., which was forced to shut down one of its furnaces here from October to the end of December due to power shortage, now has sufficient off peak power to operate all its four furnaces and the plant now is working up to capacity. The company is operating all four furnaces at Mead, Wash., and the Chicago plant, where some of its products are finished if operating at capacity.

Loss of Skilled Labor Feared

Detroit—Continued orderly changeover to defense production is necessary if copper fabricators are to retain their irreplaceable labor force, says E. R. Lovell, president, Calumet & Hecla Consolidated Copper Co., Boston. On Jan. 1, the amount of copper available for civilian consumption was cut back 15 per cent, and a 20 per cent cutback is scheduled for March based on the first six months of 1950. Current defense orders have offset only part of the production curtailment.

Full production must be maintained in the coming months if fabricators are to protect their supply of skilled labor. Mr. Lovell pointed out that the cut-back in nonmilitary use of copper in January and February of 1 per cent (based on the first six months of 1950) is about 25 per cent based on the last three months of 1950. Additional cutbacks (20 per cent for March on the government base) would thus have a much greater impact on employment than is at first apparent, he added.

"Because of the heavy requirements of other western powers there is little possibility of increasing imports of foreign copper," Mr. Lovell said. "Various projects for expanding domestic production are being submitted to the Defense Minerals Administration and these eventually will add some tonnage to present copper supplies. However, expansion of existing facilities and the development of new properties are necessarily gradual and time consuming. Furthermore, the increasing shortage of underground labor will seriously impair mine expansion in many districts. . . . Calumet & Hecla has large low grade ore reserves and, with government co-operation, can substantially add to its present output."

Copper Tubing Scarce in West

San Francisco—Copper tubing has joined the steadily growing list of metals conspicuous by their absence in the San Francisco territory. DO numbers make "all the difference," sales representatives say. Requisitioning of the warehouses by representatives of the copper products firms now is of little consequence. Orders are forwarded to the fabricating divisions of the copper companies and, if they are for special products, delays of several weeks often are encountered. If of standard sizes, more promptness may be expected. Fittings brass and bronze are in a similar status.

Antimony Price Jumps Ten Cents

New York — Price of antimony jumped 10 cents a pound on Jan. 22 to the basis of 42.00c, Laredo, Tex., for the R.M.M. brand and 42.50c for the Lone Star brand. The former price level had been in effect since Sept. 11, 1950, when a $3\frac{1}{2}$ cent advance was made effective.

The advance was attributed to higher costs for labor and raw materials, including increased prices paid for ore. Demand for the metal has been greater than supply for some time.

Bradley Mining Co., San Francisco, has resumed production of antimony at its Yellow Pine smelter, Stibnite, Idaho, and has established a price of 50.00c per pound, carload lots, f.o.b. Cascade, Idaho, for February delivery. The company is offering its Elk brand antimony oxide at 45.00c a pound, f.o.b. Cascade.

National Lead Builds in Texas

Houston—National Lead Co., New York, has awarded a contract for a new office and laboratory building in Houston. The company's Baroid Sales Division let the contract to H. K. Ferguson Co., Cleveland, for construction of an office building and research center. Completion is scheduled for July.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley; Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 29.00c; 88-10-2 (No. 215) 43.25c; 80-10-10 (No. 305) 39.00c; No. 1 yellow (No. 405) 25.00c.

Zinc: Prime western 17.50c; brass special 17.75c; intermediate 18.00c, East St. Louis; high grade 18.60c, delivered.

Lead: Common 16.80c; chemical 16.90c; corroding 16.80c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb orders.

Secondary Aluminum: Piston alloys 30.00-30.50c; No. 12 foundry alloy (No. 2 grade) 24.50-30.25c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 32.00c; grade 2, 30.00-30.25c; grade 3, 29.00-29.50c; grade 4, 28.50-29.00c. Prices include freight allowed at rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, spot, 185.00c; Jan. 183.00c; Feb. 181.00c; Mar. 174.00c; Apr. 172.00c.

Antimony: American 99-99.8% and over but not meeting specifications below 42.00c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 42.50; f.o.b. Laredo, Tex., for bulk shipments. Foreign, 99%, nominal.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 50.50c; 25-lb pigs, 53.15c; "XX" nickel shot, 54.15c; "F" nickel shot or ingots, for addition to cast iron, 58.00c. Prices include import duty.

Mercury: Open market, spot, large lots, New York, $225 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b., Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.55 del.; special or patented shapes $2.80.

Cobalt: 97.99%, $2.10 per lb for 500 lb (kegs); $2.12 per lb for 100 lb (case); $2.17 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 90.16c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill)

Sheet: Copper 39.93-41.68; yellow brass 36.86-38.28; commercial bronze, 95% 39.91-41.61; 90% 39.48-41.13; red brass, 85% 38.54-40.14, 80% 38.12-39.67; best quality 39.15; nickel silver, 18% 50.57-51.91; phosphor-bronze grade A, 5% 58.49-60.20.

Rod: Copper, hot-rolled 35.78-37.53; cold-drawn 37.03-38.78; yellow brass free cutting, 31.26-32.63; commercial bronze, 95% 39.66-41.30, 90% 39.17-40.82; red brass 85% 38.23-39.83, 80% 37.81-39.36.

Seamless Tubing: Copper 39.97-41.72; yellow brass 39.87-41.29; commercial bronze, 90% 42.14-43.79; red brass, 85% 41.45-43.05; 80% 42.58.

Wire: Yellow brass 37.15-38.57; commercial bronze, 95% 40.20; 90% 39.77-41.42; red brass, 85% 38.83-40.43; 80% 38.41-39.96; best quality brass, 39.44.

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 28.67-29.42, l.c.l. 29.17-29.92, 100,000 lb lots 28.545-29.295; weatherproof, f.o.b. eastern mills, c.l. 29.60, l.c.l. 30.10, 100,000 lb lots 29.35; magnet, del., 15,000 lb or more 34.50, l.c.l. 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders)

Sheets and Circles: 28 and 38 mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Circle Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.6	33.7
0.047-0.038	12-48	32.6	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) of distance across flats	Round R317-T4		Hexagonal	
	17S-T4	R317-T4	17S-T4	
0.125	52.0	...	...	
0.156-0.188	44.0	...	...	
0.219-0.313	41.5	...	...	
0.375	40.0	46.0	48.0	
0.406	40.0	...	...	
0.438	40.0	46.0	48.0	
0.469	40.0	...	...	
0.500	40.0	46.0	48.0	
0.531	40.0	...	...	
0.563	40.0	...	45.0	
0.594	40.0	...	...	
0.625	40.0	43.5	45.0	
0.688	40.0	...	45.0	
0.750-1.000	39.0	41.0	42.5	
1.063	39.0	...	41.0	
1.125-1.500	37.5	39.5	41.0	
1.563	37.0	...	...	
1.625	36.5	...	39.5	
1.688-2.000	36.5	...	...	

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $22.00 per cwt; add 50c cwt 10 sq ft to 140 sq. ft. Pipe: Full coils $22.00 per cwt. Traps and bends: List prices plus 60%.

ZINC

Sheets, 24.50c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 23.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 23.50-24.50c; over 12-in., 23.50-24.50c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 71.50c. Strip, cold-rolled, 77.50c. Rods and shapes, 67.50c. Plates, 69.50c. Seamless tubes, 100.50c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 57.00c. Strip, cold-rolled 60.00c. Rods and shapes, 55.00c. Plates, 56.00c. Seamless tubes, 90.00c. Shot and blocks, 50.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

DAILY PRICE RECORD

1950	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Jan. 25	24.50	16.80	17.50	185.00	19.00	42.00	50.50	90.16
Jan. 24	24.50	16.80	17.50	180.00	19.00	42.00	50.50	90.16
Jan. 23	24.50	16.80	17.50	178.00	19.00	42.00	50.50	90.16
Jan. 22	24.50	16.80	17.50	176.00	19.00	42.00	50.50	90.16
Jan. 19-20	24.50	16.80	17.50	175.50	19.00	32.00	50.50	90.16
Jan. 18	24.50	16.80	17.50	175.75	19.00	32.00	50.50	90.16
Jan. 17	24.50	16.80	17.50	176.00	19.00	32.00	50.50	90.16
Jan. 16	24.50	16.80	17.50	175.00	19.00	32.00	50.50	90.16
Jan. 15	24.50	16.80	17.50	172.00	19.00	32.00	50.50	90.16
Jan. 12-13	24.50	16.80	17.50	175.00	19.00	32.00	50.50	90.16
Jan. 11	24.50	16.80	17.50	173.00	19.00	32.00	50.50	90.16
Jan. 10	24.50	16.80	17.50	171.00	19.00	32.00	50.50	90.16
Jan. 9	24.50	16.80	17.50	163.00	19.00	32.00	50.50	90.16

NOTE: Copper; Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits ,del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 27.00c; 5 tons and over-27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb., f.o.b. shipping point, freight allowed; Flat untrimmed 37.69c; oval 37.19c; cast 37.375c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 1000 lb 61.9c, under 1000 lb 63.9c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 19.00c; 1000 to 19,900 lb, 18.0c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 200 lb, 29.25c; over 200 lb 28.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 70.00c; 10,000 to 30,000 lb, 68.00c; 3000 to 10,000 lb, 71.00c, 500 to 3000 lb, 72.00c; 100 to 500 lb, 74.00c; under 100 lb, 77.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 35.00c; 400-lb bbl, 33.00c up to 10,000 lb, 32.50c; over 10,000 lb, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; ball, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers nom.; 100 or 300 lb drums only, 100 to 500 lb, nom.; 600 to 1900 lb, nom.; 2000 to 9900 lb, nom.; f.o.b. Sewaren, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100 lb drums, less than 10 drums 47.7c, 10 or more drums 45.7c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb nom.; more than 2000 lb, nom., f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, nom.; 100 lb kegs nom., f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 20,000 lb, f.o.b. shipping point

	Clean Heavy	Rod Ends	Clean Turnings
Copper	23.00	23.00	22.25
Yellow Brass	20.125	19.875	18.75
Commercial Bronze			
95%	21.875	21.625	21.125
90%	21.75	21.50	21.00
Red brass			
85%	21.50	21.25	20.75
80%	21.375	21.125	20.625
Muntz metal	19.00	18.75	18.25
Nickel silver, 10%	22.25	22.00	11.125–
Phos. bronze, A	24.00	23.75	22.75

BRASS INGOT MAKERS' BUYING PRICES

(Cents per pound,delivered eastern refineries, carload lots)

No. 1 copper 21.50*; No. 2 copper 20.00*; light copper 19.00*; composition red brass 22.00-22.50; radiators 17.50-17.75; heavy yellow brass 17.75.

* Nominal.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 21.50*; No. 2 copper 20.00*; light copper 19.00*; refinery brass (60% copper) per dry copper content 19.50.

* Nominal.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 20.00; No. 2 18.50; light copper 17.25; No. 1 composition red brass 17.00-17.50; No. 1 composition turnings 16.50-17.00; mixed brass turnings 12.00-12.50; new brass clippings 17.50-18.00; No. 1 brass rod turnings 16.00-16.50; light brass 11.00; clean heavy yellow brass 14.50-15.00; new brass rod ends 16.50-17.00; auto radiators 14.50-15.00; cocks and faucets, 15.50-16.00; brass pipe 17.00-17.50.

Lead: Heavy 14.50-14.75; battery plates 8.75-9.00; linotype and stereotype 14.50-14.75; electrotype 12.75-13.00; mixed babbitt 12.25-12.50.

Zinc: Old zinc 11.00-11.25; new die cast scrap 10.75-11.00; old die cast scrap 8.00-8.25.

Tin: No. 1 pewter 63.00-65.00; block tin pipe 90.00; No. 1 babbitt 58.00-60.00.

Aluminum: Clippings 28 19.00-19.50; old sheets 15.50-16.00; crankcase 15.50-16.00; borings and turnings 12.00-12.50.

UNIVERSITY OF MICHIGAN LIBRARIES

IRON AND STEEL SCRAP

Consumers prices, except as otherwise noted, including brokers' commissions, as reported to STEEL, Jan. 25, 1951; gross tons
Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Jan. 25	$46.33
Jan. 18	46.33
Dec. 1950	45.50
Jan. 1950	26.93
Jan. 1946	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 Heavy Melt.	$46.50
No. 2 Heavy Melt.	44.50
No. 1 Busheling	46.50
No. 1 Bundles	46.50
No. 2 Bundles	43.50
Heavy Turnings	47.00-48.00
Machine Shop Turnings	38.50
Mixed Borings, Turnings	38.50
Short Shovel Turnings	*40.50*
Cast Iron Borings	39.50-40.50
Low Phos. Steel	56.00-57.00

Cast Iron Grades

No. 1 Cupola Cast	58.00-60.00
No. 1 Machinery Cast	68.00-70.00
Charging Box Cast	55.00-56.00
Heavy Breakable Cast	54.00-55.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	46.50
Rails, Random Lengths	64.00-65.00
Rails, 2 ft and under	68.00-69.00
Rails, 18 in. and under	69.00-70.00
Railroad Specialties	65.50-66.50

CLEVELAND

(Delivered Consuming Plant)

No. 1 Heavy Melt. Steel	$45.50-46.00†
No. 2 Heavy Melt. Steel	43.50-44.00†
No. 1 Busheling	45.50-46.00†
No. 1 Bundles	45.50-46.00†
No. 2 Bundles	40.00-42.00
Machine Shop Turnings	37.50-38.00
Mixed Borings, Turnings	39.00-40.00
Short Shovel Turnings	39.00-40.00
Cast Iron Borings	39.50-40.00
Low Phos.	48.00-48.50

Cast Iron Grades

No. 1 Cupola	65.00-66.00
Charging Box Cast	53.00-54.00
Stove Plate	55.00-56.00
Heavy Breakable Cast	55.00-56.00
Unstripped Motor Blocks	44.00-45.00
Brake Shoes	50.00-51.00
Clean Auto Cast	65.00-66.00
Burnt Cast	46.00-47.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	46.00-46.50
R.R. Malleable	72.00-73.00
Rails, 3 ft and under	70.00-71.00
Rails, 18 in. and under	71.00-72.00
Rails, Random Lengths	64.00-65.00
Cast Steel	58.00-59.00
Railroad Specialties	60.00-61.00
Uncut Tires	60.00-61.00
Angles, Splice Bars	65.00-66.00

† Plus applicable springboards

VALLEY

No. 1 Heavy Melt. Steel	$46.00-46.50†
No. 2 Heavy Melt. Steel	44.00-44.50†
No. 1 Bundles	46.00-46.50†
Facty. Prod. Bundles	46.00-46.50†
No. 2 Bundles	40.50-42.50
Machine Shop Turnings	38.00-38.50
Short Shovel Turnings	40.00-40.50
Cast Iron Borings	40.00-40.50
Low Phos.	48.50-49.00

† Plus applicable springboards

Railroad Scrap

No. 1 R.R. Heavy Melt.	46.00-46.50

PHILADELPHIA

No. 1 Heavy Melt. Steel	*$47.50*
No. 2 Heavy Melt. Steel	*45.00*
No. 1 Busheling	*45.00*
No. 1 Bundles	*47.50*
No. 2 Bundles	*44.00*
Short Shovel Turnings	39.00
Machine Shop Turnings	37.00
Mixed Borings, Turnings	37.00
Low Phos. Punchings and Plate, elec. fur. grade	*53.00*
Low Phos. Plate, 5 ft. & Under	*53.00*
Elec. Furnace Bundles	*50.00*
Heavy Turnings	*47.00*
No. 1 Chemical Borings	45.00
Knuckles and couplers	56.00-58.00
Steel car wheels	56.00-58.00

Cast Iron Grades

No. 1 Cupola Cast	54.00-55.00
No. 1 Machinery Cast	58.00-60.00
No. 1 Yard Cast	53.00
Charging Box Cast	54.00-55.00
Heavy Breakable Cast	54.00-55.00
No. 1 Wheels	70.00*
Malleable	70.00-72.00

* Nominal

CINCINNATI

No. 1 Heavy Melt. Steel	**$46.00**
No. 2 Heavy Melt. Steel	**44.00**
No. 1 Busheling	**46.00**
No. 1 Bundles	**46.00**
No. 1 Black Bundles	**46.00**
Machine Shop Turnings	**33.00**
Short Shovel Turnings	**34.00**
Mixed Borings, Turnings	**33.00**
Cast Iron Borings	**34.00**

Cast Iron Grades

No. 1 Cupola Cast	**70.00**
Charging Box Cast	**60.00**
Stove Plate	**55.00**
Heavy Breakable Cast	**56.00**
Unstripped Motor Blocks	**42.00**
Brake Shoes	**37.00**
Clean Auto Cast	**70.00**
Drop Broken Cast	**72.50**
Low Phos., 18 in. and under	**62.00**

Railroad Scrap

No. 1 R.R. Heavy Melt.	**46.00**
R.R. Malleable	**64.00**
Rails, Rerolling	**65.00**
Rails, Random Lengths	**65.00**
Rails, 18 in. and under	**72.50**

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 2 Heavy Melt. Steel	$38.25-39.00
No. 1 Bundles	*40.25-51.00*
No. 2 Bundles	37.25-37.50
No. 1 Busheling	*40.25-51.00*
Machine Shop Turnings	32.25-33.00
Forge Flashings	*40.25-51.00*
Short Shovel Turnings	34.25-35.00
Cast Iron Borings	34.00-35.00
Punchings & Plate Scrap	42.75-46.00

Cast Iron Grades

No. 1 Cupola Cast	54.00-55.00
Heavy Breakable Cast	46.00-48.00
Clean Auto Cast	59.00-60.00

BUFFALO

No. 1 Heavy Melt. Steel	*$51.00-52.00*
No. 2 Heavy Melt. Steel	*49.00-50.00*
No. 1 Busheling	*49.00-50.00*
No. 1 Bundles	*50.00-51.00*
No. 2 Bundles	*47.00-48.00*
Machine Shop Turnings	*43.00-44.00*
Mixed Borings, Turnings	*43.00-44.00*
Cast Iron Borings	*43.00-44.00*
Short Shovelings	*45.00-46.00*
Low Phos.	*52.00-53.00*

Cast Iron Grades

No. 1 Cupola	54.00-55.00
No. 1 Machinery	59.00-60.00
Malleable	nominal

Railroad Scrap

Rails, 2 ft and under	60.00-61.00
Rails, random size	55.00-56.00
Railroad Specialties	55.00-56.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$42.00-44.00
No. 2 Heavy Melt. Steel	40.00
No. 1 Busheling	41.00
No. 1 Bundles	42.00-44.00
No. 2 Bundles	39.00
Mixed Borings, Turnings	34.00
Machine Shop Turnings	34.00
Short Shovel Turnings	36.00
Punchings & Plate Scrap	44.50
Low Phos. Plate, 5 ft & under	44.50
Elec. Furnace Bundles	44.50

Cast Iron Grades

No. 1 Cupola Cast	47.00-48.00
No. 1 Machinery	49.00-50.00
Charging Box Cast	44.00-45.00
Heavy Breakable	44.00-45.00
Unstripped Motor Blocks	41.00-42.00

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	*$41.50-42.00*
No. 2 Heavy Melt. Steel	*37.00-38.00*
No. 1 Bundles	*41.50-42.00*
No. 1 Busheling	*38.00-39.00*
Machine Shop Turnings	*30.00-30.50*
Short shovel Turnings	*31.00-31.50*
Mixed Borings, Turnings	*31.00-31.50*
Bar Crops and Plate	44.50-45.00
Punchings & Plate Scrap	44.50-45.00
Chemical Borings	*34.50-35.00*

Cast Iron Grades

No. 1 Machinery Cast	50.00-51.00
Mixed Cast	*45.00-46.00*
Heavy Breakable Cast	43.50-44.50
Stove Plate	42.00-43.00

CHICAGO

No. 1 Heavy Melt. Steel	**$45.00**
No. 2 Heavy Melt. Steel	**43.00**
No. 1 Bundles	**45.00**
No. 2 Bundles	**42.00**
Machine Shop Turnings	34.00-35.00
Mixed Borings, Turnings	34.00-35.00
Short Shovel Turnings	35.00-36.00
Cast Iron Borings	35.00-36.00
Low Phos.	**52.00-54.00**
Elec. Furnace Bundles	**46.00-48.00**
Heavy Turnings	**41.00-42.00**
Cut Structurals	**50.00-51.00**

Cast Iron Grades

No. 1 Cupola Cast	61.00-63.00
Clean Auto Cast	64.00-65.00
No. 1 Wheels	60.00-62.00
Stove Plate	49.00-50.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	46.00-47.00*
Malleable	73.00-75.00
Rails, Rerolling	66.00-68.00*
Rails, Random Lengths	58.00-59.00
Rails, 2 ft. and under	66.00-67.00
Rails, 18 in. and under	67.00-68.00
Railroad Specialties	56.00-57.00
Angles, Splice Bars	58.00-59.00

* Brokers' buying price.

BIRMINGHAM

No. 1 Heavy Melt. Steel	$42.00-43.00
No. 2 Heavy Melt. Steel	41.50
No. 1 Busheling	40.00-41.00
No. 2 Bundles	40.50
Machine Shop Turnings	34.00-35.00
Mixed Borings, Turnings	35.50
Short Shovel Turnings	37.50
Cast Iron Borings	33.00-34.00
Bar Crops and Plate	46.00-47.00
Cut Structurals	46.00-47.00

Cast Iron Grades

No. 1 Cupola Cast	55.00-56.00
Stove Plate	49.00-50.00
No. 1 Wheels	nominal

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.50
R.R. Malleable	nominal
Rails, Rerolling	60.00-61.00
Rails, 2 ft and under	65.00-66.00
Angles and Splice Bars	59.00-60.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$46.00-47.00
No. 2 Heavy Melt. Steel	41.50-42.50
No. 1 Bundles	46.00-47.00
No. 2 Bundles	40.50-41.50
Machine Shop Turnings	33.00-34.00
Short Shovel Turnings	35.00-37.00

Cast Iron Grades

No. 1 Cupola Cast	*56.00-58.00*
Charging Box Cast	*47.00-48.00*
Heavy Breakable Cast	56.00-57.00
Brake Shoes	56.00-58.00
Clean Auto Cast	*65.00-65.00*
Burnt Cast	53.00-54.00

Railroad Scrap

R.R. Malleable	63.00-65.00
Rails, Rerolling	66.00-68.00
Rails, Random Lengths	59.00-61.00
Rails, 2 ft and under	65.00-67.00
Uncut Tires	57.00-58.00
Angles, Splice Bars	66.00-68.00
Railroad Specialties	60.00-62.00

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No. 1 Heavy Melt. Steel	$30.00
No. 2 Heavy Melt. Steel	28.00
No. 1 Bundles	30.00
No. 2 Bundles	28.00
No. 3 Bundles	25.00
Machine Shop Turnings	16.00
Low Phos. Electric	45.00

Cast Iron Grades

No. 1 Cupola Cast	*42.00-42.50*

Railroad Scrap

No. 1 R.R. Heavy Melt.	30.00
Rails, Random Lengths	30.00

SEATTLE

No. 1 Heavy Melt. Steel	$32.00
No. 2 Heavy Melt. Steel	32.00
No. 1 Busheling	25.50-26.00
Nos. 1 & 2 Bundles	25.50-26.00
No. 3 Bundles	22.00
Machine Shop Turnings	20.00
Mixed Borings, Turnings	20.00
Punchings & Plate Scrap	40.00-44.00
Cut Structurals	40.00-44.00

Cast Iron Grades

No. 1 Cupola Cast	42.00-44.00
Heavy Breakable Cast	38.00-40.00
Stove Plate	36.00-38.00
Unstripped Motor Blocks	33.00-35.00
Malleable	33.00-35.00
Brake Shoes	35.00
Clean Auto Cast	40.00
No. 1 Wheels	40.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.00-33.00
Railroad Malleable	35.00
Rails, Random Lengths	32.00-33.00
Angles and Splice Bars	32.00-33.00

LOS ANGELES

(Delivered prices)

No. 1 Heavy Melt. Steel	$30.00
No. 2 Heavy Melt. Steel	28.00
No. 1 Bundles	30.00
No. 2 Bundles	28.00
No. 3 Bundles	25.00
Machine Shop Turnings	16.00
Punchings & Plate Scrap	42.00-45.00

Cast Iron Grades

No. 1 Cupola Cast	45.00-48.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	nominal
Rails, Rerolling	48.00

HAMILTON, ONT.

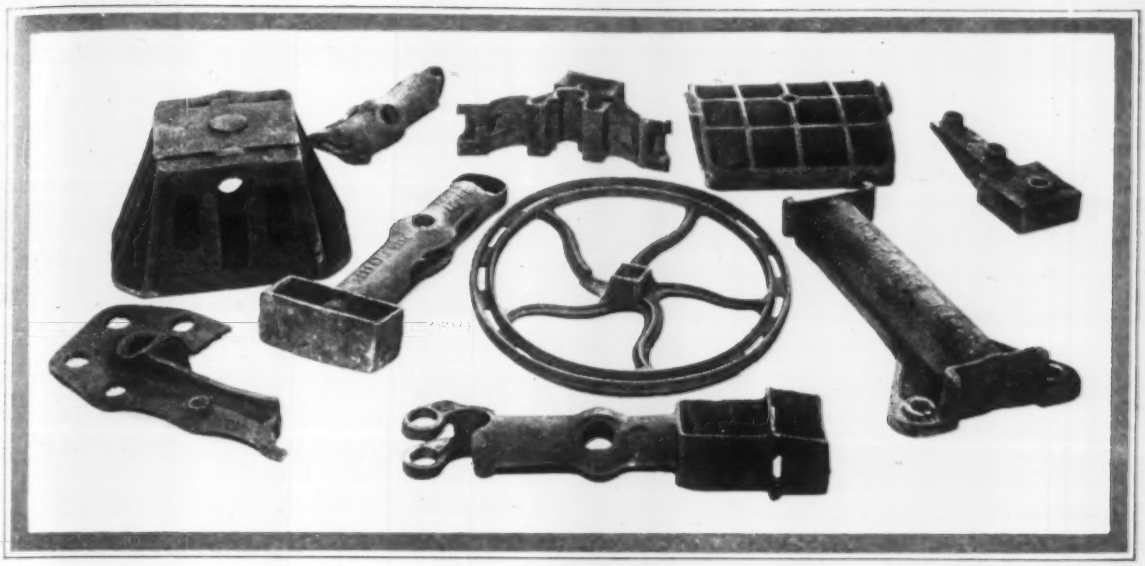
(Delivered prices)

Heavy Melt.	**$30.00**
No. 1 Bundles	**30.00**
Mechanical Bundles	**28.00**
Mixed Steel Scrap	**28.00**
Mixed Borings, Turnings	**23.00**
Rails, Remelting	**30.00**
Rails, Rerolling	**33.00**
Busheling	**24.50**
Bushelings new factory, prep'd	**23.00**
Bushelings new factory, unprep'd	**22.00**
Short Steel Turnings	**23.00**

Cast Iron Grades*

No. 1 Machinery Cast.	**50.00**

* F.o.b. shipping point.



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specifications:

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Malleable scrap must be free of metallic alloys, chrome and sulphur because these chemicals produce "hard spots" in the castings.

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Sheets, Strip . . .

Sheet and Strip Prices, Page 161 A

Cleveland—Rated orders on sheet and strip producers' books run to large tonnage and the increase in the percentage set-asides under NPA's amended M-1 will substantially increase the mill load. This means that still less flat-rolled tonnage will be available for the regular market.

Percentage set-aside on hot and cold-rolled carbon sheets now is 12 per cent, galvanized 7, enameling 5, electrical sheets and strip 7, hot and cold-rolled strip 10. Stainless steel sheet and strip set-aside now is 25 per cent, alloy hot and cold-rolled sheets and strip 5, and alloy electrical sheets and strip 7.

Youngstown Sheet & Tube Co. plans to shut down the blooming mill at its Campbell Works for extensive repairs in March. The mill is expected to be out of production about a month.

New York—Non-rated consumers of sheets are experiencing increasing difficulty in getting tonnages in the amount they desire. However, only a relatively small percentage of tonnage so far has gone into DO-rated orders. By early in second quarter, though, these military orders will be stepped up materially, it is believed, and there will be considerably more tonnage for allocated programs.

Boston—While some non-integrated cold strip mills have scheduled for April, revisions are likely due to lack of hot strip to meet specifications. More rated orders are reaching converters.

Philadelphia—Sheet fabricating companies are quickening efforts to obtain defense work. One manufacturer of roller skates, whose future market might be jeopardized by stringency in plain materials, has scurried around and developed work in production of rocket caps and more of this sort of thing is going on.

For the present and probably for some time to come the great proportion of plain carbon sheets will be going into commercial work. Even under the regulation recently announced it is necessary for producers to set aside only 12 per cent for hot and cold-rolled sheets, for DO-rated orders, and in hot and cold strip only 10 per cent.

Pittsburgh—Sheet and strip producers are booked through March on the set-aside tonnage recently established by NPA. The few openings left in April production schedules will be quickly filled. Nonintegrated cold-rolled sheet and strip producers are expected to rely to greater extent on conversion steel supplied by customers to maintain current production pace.

Cincinnati—Fabricators not engaged on military needs are meeting little success in their efforts to get more sheet tonnage. Mill schedules show a tighter supply situation than heretofore despite attempts toward conservative bookings to hold down carryover.

St. Louis—Granite City Steel Co. is catching up on delayed orders for cold-rolled sheets and indications are the company will be current by April, barring sharp increases in its DO allotment.

Birmingham—Consumers of sheets

INSIDE STORY..

ON SCRAP RECLAMATION

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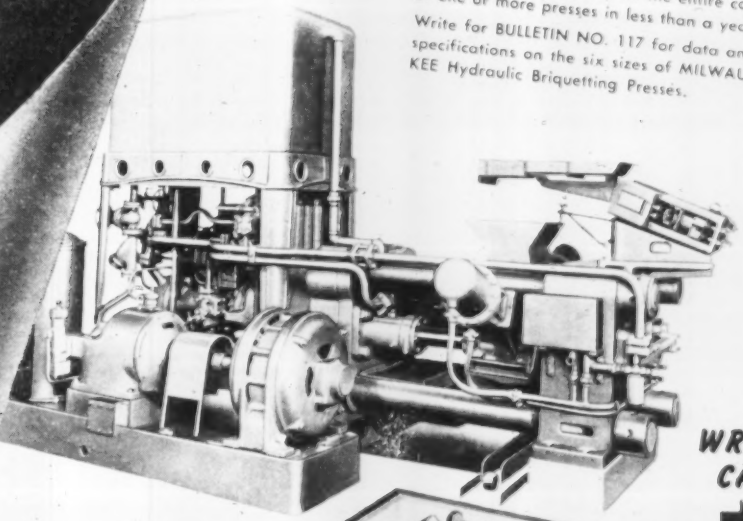

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are worried over probable cutbacks in quotas for normal production. Defense orders may soon necessitate shaving current allocations for civilian use.

San Francisco—Demand for sheets continues heavy with little prospect of any easing in supply conditions.

Alloy Steel . . .

New York—While several of the NE steels were made standard after the last war, the steel industry now is studying the possibility of using even leaner alloys for limited sizes; also use of boron in standard steels. This is being done with a view to conserving use of conventional alloying elements, such as nickel and chrome. The NE steels which have been carried over since World War II comprise the 8600, 8700, 9300, 9400, 9700 and 9800 series. Demand for these alloy steels since the outbreak of war in Korea has increased more than 35 per cent.

Steel Bars . . .

Bar Prices, Page 101

Pittsburgh—Alloy and carbon bar producers report gradual trend toward preference for larger sizes on rated orders. Some alloy bar mills are booked into May on rated tonnage, notably electric furnace grades. Recent upward adjustments in percentage set-asides for DO rated orders are expected to open up some rolling time next quarter for additional bookings of essential tonnage.

Cleveland—More pressure is noted in the bar market for defense requirements. Shell needs are rising and demand from the forge shops increasingly is on DO account. This explains last week's stepup in percentage set aside ordered by the NPA for rated business. The setaside had been 5 per cent on carbon bars; now it is 10. Alloy bar setaside has been upped to 35 per cent from 25, while that on reinforcing bars is boosted to 15 per cent from 5.

New York—DO-rated orders for bars, especially alloy bars, are increasing, although delivery promises are not so far extended as early in the month for the reason minimum set-asides, covering amounts of DO-rated orders the companies must accept, have since been increased. Some producers of alloy bars who were sold out through the latter part of second quarter can now offer tonnage for delivery as early as April and in some cases have rolled back shipments to March where the request was originally for that month but where the tonnage was not entered for delivery until some time thereafter.

Boston—More rated bar tonnage will go to consumers in March. Under former limitations directly rated schedules were becoming too extended. Lead time on hot-rolled annealed or heat-treated bars is now 60 days and cold-finished 90 days. Rated bar orders are heavier, notably alloys.

Philadelphia — Heavy orders for shell work are expected soon to stimulate activity in bars and other types of steel. Bar production in second quarter should also reflect needs of the locomotive building and repair program. It is estimated about 70,000

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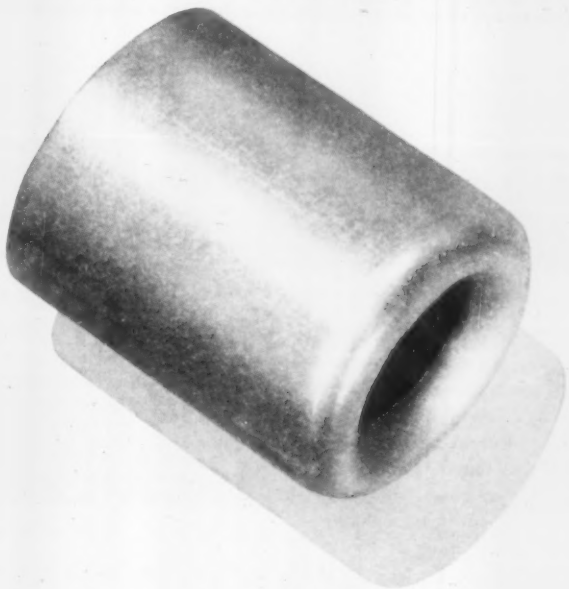

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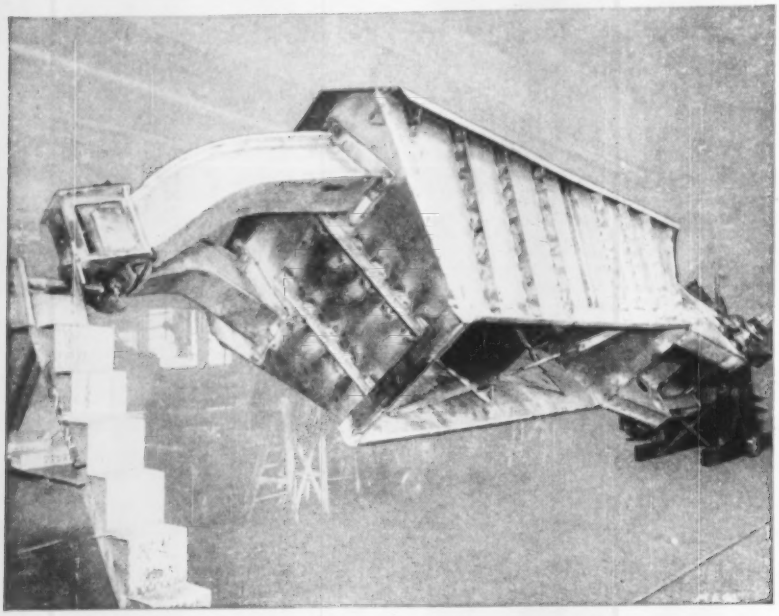

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tons of steel of various types per month will be required for locomotive work.

San Francisco—Demand exceeds supply, but sellers report the chance of meeting orders on steel bars is not as great as in some other items.

Seattle—Inquiry for small jobs has slowed but rolling mills have impressive backlogs and are operating at capacity. Considerable tonnage is pending for military installations in Alaska. Demand for merchant bars is exceptionally strong.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 101

Los Angeles—Fabricators are working on 10 hour-6 day work week schedules to meet customers' speeded-up requirements. With expanding order books, fabricators have yet to feel construction slowdown. Ground was broken on Fontana's largest project, the $1 million Fontana high school.

Tubular Goods . . .

Tubular Goods Prices, Page 104

San Francisco—Leading sales organizations report supplies of tubular goods "getting out of sight." Even specialty items, like electrically welded tubing, are extremely difficult to obtain.

Seattle—Cast iron pipe demand is increasing as the season advances. Most bid calls include alternatives due to slow deliveries from eastern plants which are specifying delivery in 180 to 200 days.

Plates . . .

Plate Prices, Page 101

New York—Apart from rated tonnage, plate producers are out of the market. They are receiving nonrated specifications but are not entering them in their books until around the middle of next month when they will set up schedules for April. On allocated programs they undoubtedly will be in position by that time to set up schedules for the entire second quarter, as these programs are usually laid out on a quarterly basis.

Boston—Directly rated tonnage schedules extend into May with prospect of lower allocations for civilian uses in second quarter. Essential and DO tonnage requirements are not heavy in this area, but district allocations are affected at mill levels by increasing overall demand.

Philadelphia—Plate producers anticipate substantially heavier defense work in second quarter as new special programs for locomotive construction and repairs and cargo vessels have become established. A program for oil country goods also will have bearing, to say nothing of a step-up in DO-rated orders for military purposes.

Birmingham—Plate mills are heavily booked ahead. Additional needs for car production are indicated for the immediate future.

Seattle—Expansion programs of several large oil companies at Pacific northwest centers involve increased tankage and a considerable tonnage of plates. Award of 2500 tons of steel piling for the Seattle viaduct pends.

Tin Plate . . .

Tin Plate Prices, Page 102

Pittsburgh — Tin plate producers are awaiting decision by the National Production Authority as to how much tin will be available to them for second quarter production schedules. Consumers are requesting firm commitments for the period and the lead-time requirement for April shipments is Feb. 15. Tin plate setaside is unchanged at 5 per cent but regulations covering end-use limitations and maximum coatings on containers are expected momentarily.

San Francisco—California's canned pack of fruits and vegetables reached 65,561,774 cases in 1950 from 63,109,075 in 1949, according to figures released by the Canners League. Vegetables gained to 33,021,774 cases from 30,529,075 more than offsetting a loss in fruits to 32,540,000 from 32,580,000.

Structural Shapes . . .

Structural Shape Prices, Page 101

Boston—For relatively early delivery, around three months on 300 tons or less, fabricated structural steel prices are again near postwar peak with 15.00-16.00c per pound frequently paid. Shops, in turn, are paying premium prices for plain material, sometimes from stock outside this district. New tonnage being estimated is lower. Bridge programs are delayed and restrictions on some types of construction are slowing inquiry. Considerable long-range power plant construction is on boards and one 1100-ton contract has been placed at New Haven. Connecticut has also closed on bridges, 2600 tons.

New York—It is still too early to appraise the influence of governmental restrictions on commercial building as regards structural steel tonnage now on order with fabricators. Unquestionably various orders on fabricators' books on which no fabrication has been started and for which no work has been begun on site preparation will not be given the green light by government. However, fabricators' backlogs will be less affected than others, especially where the shops have long anticipated controls and have been moving cautiously in accepting certain types of work. Some large fabricators doubt if restrictions will ease current delivery promises by more than two months at most. These fabricators' backlogs now range up to 14 months.

Philadelphia — Structural fabricators are moving cautiously in figuring new business. Even industrial projects are being scrutinized carefully. Placing of the 6000-ton power plant for the Philadelphia Electric Co. at Cromby, Pa., is expected shortly.

Los Angeles—Shortages of structurals and plates is slowing operations of oil well equipment fabricators. Suppliers of the nonrated oil industry are getting only about 10 per cent of steel they need.

San Francisco—Possibly invoking an idea of how thin the supply is spread is a report by one fabricator that it is only getting about 25 per cent of the structural shapes it was able to obtain six months ago.

Seattle—Fabricators have better

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than average order backlogs, but scarcity of certain steel items is restricting bidding. Several important Alaskan projects involve large tonnages.

Semifinished Steel . . .

Semifinished Prices, Page 101

Los Angeles—Despite production troubles and shortages of semifinished steel Kaiser Steel Corp. in December shipped a record 70,000 tons of finished steel products. Approximately 15 per cent of Fontana's production capacity is set aside for DO orders.

Wire . . .

Wire Prices, Page 103

Cleveland—Increase in the mill setaside on certain wire products under amended NPA order M-1 will further tighten supply for the general market. Under the amended regulation the setaside on low carbon drawn wire is unchanged at 5 per cent, but wire rod is up to 10 per cent from 5, and high carbon drawn wire is increased from 5 to 15 per cent. Stainless and alloy setaside is 25 per cent. Lead time is unchanged at 45 days. Wire rope and strand, netting and welded wire fabrics are brought under inventory control in the amended order.

Pittsburgh—Sellers note moderate increase in rated tonnage bookings. However, the 5 per cent set-aside on DO orders apparently is adequate on low carbon drawn wire grades since it was not increased as was the case on other steel products for March shipment. However, tight supply in wire rods necessitated raising the percentage set-aside from 5 to 10 per cent and on high carbon drawn wire from 5 to 15 per cent.

Boston — Rod supply to balance heavy demand is tightening, notably alloy grades. Volume of rated orders for alloys is increasing.

Birmingham—Wire products are being distributed on the basis of customers' purchase records and apparent need. Weather has slowed down construction to considerable degree.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 104

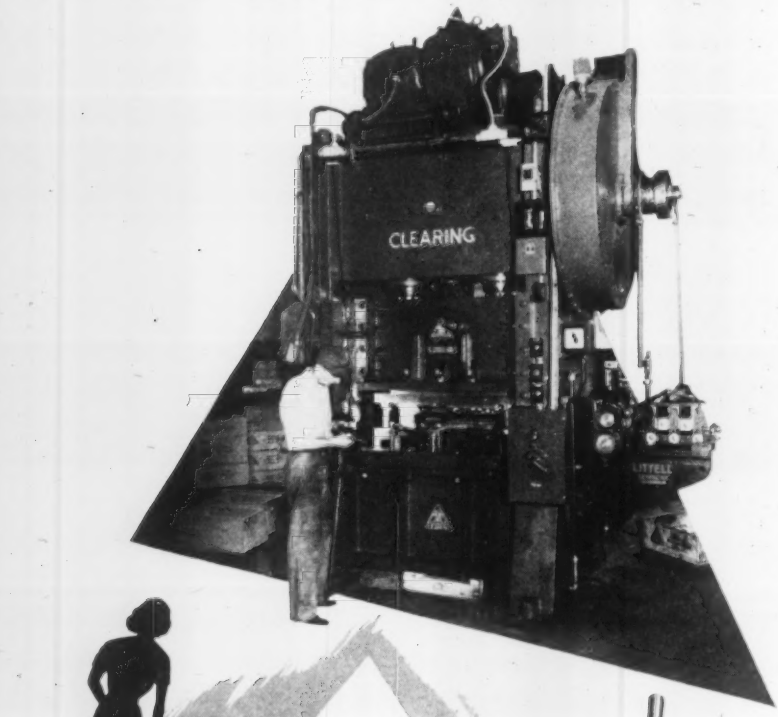
Pittsburgh — Fastener producers are seeking allocation of steel so they can supply stepped-up railroad requirements. At present needs for essential programs are deductible from regular mill allotments.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 104

Pittsburgh—Recent coal wage settlement is expected to force upward revisions in prices for beehive and oven foundry and furnace coke. Pending decision on the railroads' request for a 6 per cent across-the-board increase in freight rates is another factor that coke producers must consider in determining future price policy.

Cleveland—Rise in oven coke prices is expected to offset any increase in coal prices resulting from the 20 cents



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[illegible] hour mine wage increase. Word [illegible] the trade last week indicated bituminous coal prices in Pennsylvania, Ohio and northern West Virginia will be raised from 20 cents to 35 cents per ton Feb. 1.

Rails, Cars . . .

Track Material Prices, Page 103

Birmingham—Largest order for railroad cars ever placed in this district was awarded Jan. 22 to the Bessemer plant of Pullman-Standard Car Co. by the Louisville & Nashville railroad. The order is for 3000 fifty-ton standard coal hoppers and 2200 PS-1 box cars.

Pig Iron . . .

Pig Iron Prices, Page 100

Cleveland—Under NPA order M-1, amended, consumers are permitted to carry no more than a 30-day inventory of pig iron. Some trade interests think this limitation too severe since normally foundries carry around a 45-day stockpile. However, few shops have been able to build such stocks over recent months so that the regulation does not mean too much under present stringent supply conditions. In the trade the inventory limitation on pig iron is thought to be the likely forerunner of probable allocation of iron to defense requirements. However, no indication has yet been given that such action is in the cards for early application. Some foreign iron is coming into this area, largely malleable and basic, at prices ranging from $65 to $70 c.i.f.

Under amended M-1 pig iron orders carry 45 days lead time, iron with more than 6 per cent silicon not being included. Malleable and gray iron castings, exclusive of cast iron soil and pressure pipe, also now come under M-1, provision being made for 60 days lead time and product limitation or setaside of 20 per cent.

Buffalo—Urgency continues to rule demand for merchant pig iron. Talk is heard of allocations and controls to assure a flow of material to government contractors.

Pittsburgh—Demand for cast armor castings has improved substantially. Foundries producing heavy machinery castings and specialties for expansion programs in the railroad, steel, aluminum and other industries expect to operate at practical capacity throughout 1951. Pittsburgh Steel Co. plans to increase its pig iron capacity by an undisclosed amount through enlarging of two 600-ton blast furnaces at Monessen, Pa.

New York—Shortage of pig iron hasn't yet reached the point where district consumers have had to curtail operations. That point isn't far off, some buyers believe, and also if foundries generally were to go on a 6-day week basis they soon would not have enough iron to carry on at this higher schedule, it is felt.

Actually a few foundries are working on a 6-day schedule and certain others have sufficient business in sight to go to such a schedule if they desire to do so. But in some cases at least they are holding off because of the overtime wages and also fear the men would knock off with more

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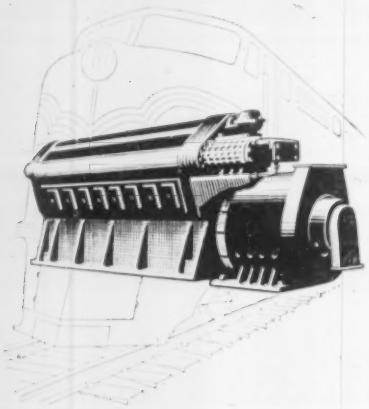

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or less regularity on some other day of the week instead so that operations wouldn't be stepped up sufficiently to make it worth while, considering the extra cost.

For the present and for some time past foundries have been relying upon an increasing amount of pig iron in ferroalloys, along with more foreign iron, to sustain operations.

Foreign iron is becoming increasingly difficult to obtain. Some importers haven't anything more to offer for shipment in first half but others can promise shipments for late March and April and at reasonable prices under the circumstances.

Believed to be the first sizable tonnage of Brazilian pig iron exported from that country to the United States, 11,200 tons left Victoria Jan. 17 for Philadelphia, aboard the SS *Ernesto*. Another cargo of Brazilian iron, 8000 tons, is being loaded for early shipment to this country.

Boston—Foundry melt has built up to point more iron consumers are showing concern as to supply.

Cincinnati—Furnace interests are holding firmly to their policy of spreading available pig iron among melters.

St. Louis—Negotiations for sale of Koppers Co.'s two blast furnaces at Granite City, Ill., which supply 90 per cent of the district's iron, to Granite City Steel Co. have been under way several weeks. Consumers are concerned at what may happen to their supplies, since Granite City Steel already takes half of Koppers' 1060-ton daily output.

Birmingham—Growing shortage of merchant pig iron is reported. Sellers are dividing output as equably as possible.

Scrap . . .

Scrap Prices, Page 108

Pittsburgh—Mills refuse to pay above formula price levels for open-hearth grades. Little remote tonnage is shipped here from the northeastern area on old orders due to higher prices paid by mills in that district. Mill scrap inventories, in combination with anticipated heavy influx of customer scrap, are ample for the present. Heavy demand for cast grades is unabated. Some trade officials anticipate a substantial reduction in prices for cast scrap when price ceilings are established.

Detroit—Scrap market came to a full boil last week with some lists being bid in at about $10 over the formula for No. 1 grades as traders gambled that only a small quantity could be shipped out of generators' plants at these prices and the rest would come under the expected ceiling. Some, therefore, expect to have more scrap under contract than would have been obtained from more conservative bidding. Contracts generally are made with the understanding that prices are subject to government ceiling at time of delivery. Consequently, every dealer was working feverishly to get as much scrap out of his yard as possible before the freeze.

Chicago—Scrap trading is at a minimum pending government action on prices. Prices on all grades are unchanged. Mill buying is held in

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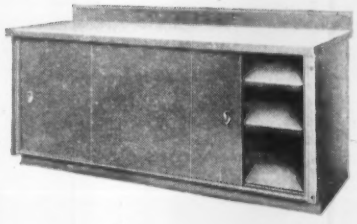

-SPS-

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...ance but receipts are in good ...ce, brokers shipping against old ... It is reported, but not con... some steelmaking scrap is ... east from this area at an ... price approximately $1 over the ... schedule.

Boston — Confusion marks steel ... prices previous to expected roll... in prices. Usual differentials ...een grades collapsed as some ad... about $5 per ton while others ... upward less than half that ...unt. Bulk of activity centers in ... 2 heavy melting around $38.50 ...pping point.

New York—Pending details of gov...ment price controls, brokers' buy... prices are uncharged.

Philadelphia—Details of price freeze ... scrap are awaited by the trade as this issue goes to press. Meanwhile, prices on principal steelmaking grades are unchanged. Low phos grades advanced $2 to $53. Electric furnace bundles are higher at $50.

Buffalo—Scrap prices soared $5.50 to $6.75 per ton in this area as substantial orders were placed by a mill consumer. The business followed rumors of other buyers negotiating secretly for tonnages above formula prices. Recent sales boosted No. 1 heavy melting to $51-$52.

Cincinnati—Iron and steel scrap prices are holding at formula on old contracts. New business is desultory as dealers await price control developments.

St. Louis—Scrap market is inactive, awaiting control developments. Prices are unchanged, except for minor adjustments.

Los Angeles—With price controls expected momentarily the district scrap market is confused. Buying of foundry grades has tapered because melters anticipate lower prices. The steel mills, however, are in the market for steelmaking scrap on a substantial scale. Sales of No. 1 heavy melting are being made at prices 30 per cent higher than posted.

San Francisco — Brokers report slightly lower average price for No. 1 cupola cast and unchanged levels for steelmaking grades.

Seattle—Scrap buyers are exploring every possible source as mills continue to press for tonnage.

Cleveland—Scrap is moving at fast pace in this district. Mills are receiving good tonnages on old contracts, but are awaiting the government's price action before making new commitments. If scrap prices are pegged at levels prevailing in the first week of January, there will be little change here from present levels; No. 1 heavy melting was quoted $45.50-$46 during both periods.

Fluorspar . . .

Fluorspar Prices, Page 104

Cleveland—Washed gravel fluorspar prices advanced $2 Jan. 15 to the basis of $43 for the 70 per cent grade and $40 for the 60 per cent grade. These prices are on the basis of effective CaF content, net tons in carload lots, f.o.b. shipping point in Illinois and Kentucky.

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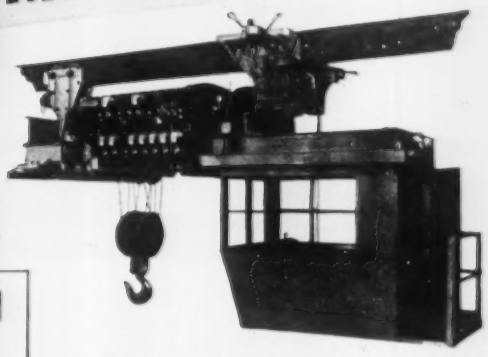
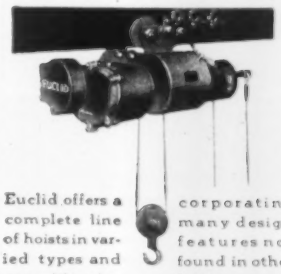


Write for Literature Describing EUCLID CRANES and HOISTS



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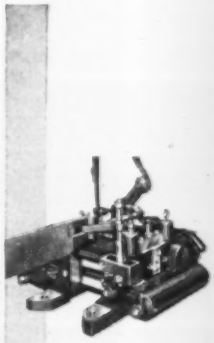

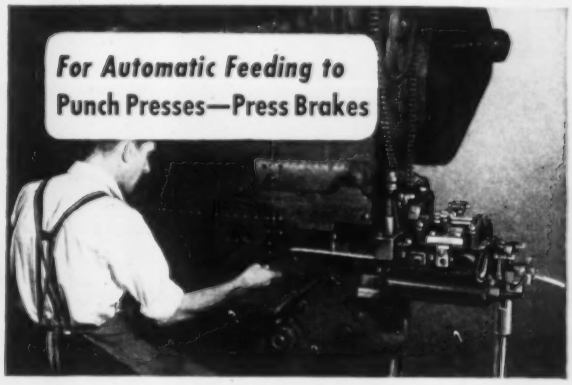

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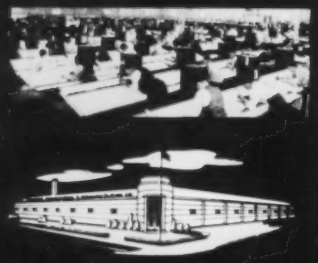

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Warehouse . . .

Warehouse Prices, Page 105

Pittsburgh — Upward adjustments in percentage setasides on rated orders means further reduction in tonnage receipts by warehouses. Practice of some distributors limiting order acceptance to rated tonnage on a few products in short supply so as to assure partial replacement of depleted inventories was criticized by NPA officials recently and prompted a threat by the agency to revise steel warehouse order M-6.

Cleveland — Prospects for substantial early replenishment of steel warehouse stocks is further darkened by the increase in mill tonnage setasides on the various products for DO orders under amended M-1 of the National Production Authority. Distributors' needs must be cared for only after rated tonnage requirements have been provided for under NPA order M-6 which has been in effect since late last fall.

Boston — What may be expected from mills under warehouse quotas for February is conjectural. Normally next month would test the warehouse allotment order, but indications are many suppliers will not get out the tonnage expected. Meanwhile, warehouse stocks are depleted on more products with demand well in excess of inventory.

New York — Distributors are frequently hampered by relatively low quotas based on orders last year. Demand for steel from warehouse exceeds supply.

Philadelphia — Some warehouses report business will be off slightly this month due to scarcity of steel. Warehouse order M-6 has not proved as helpful as anticipated.

Cincinnati—Mill shipments to warehouses are shipping because of inability to fill commitments.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

3000 tons, power house, Paducah, Ky., to Ingalls Iron Works, Birmingham, Ala.

1885 tons, including 950 tons silicon steel, 792-foot, four-span deck girder bridge, Housatonic river, Newton-Southbury, Conn., to American Bridge Co., Pittsburgh; Mariani Construction Co., New Haven, general contractor.

1780 tons, garage, Pennsylvania Railroad station, New York, to American Bridge Co., Pittsburgh.

1200 tons, power house, Pennsylvania Power & Light Co., Sunbury, Pa., through Foster Wheeler Co., New York, to Bethlehem Steel Co.

1100 tons, power plant, United Illuminating Co., New Haven, Conn., to American Bridge Co., Pittsburgh.

1000 tons, transmission towers, principally in the vicinity of Paterson, N. J., for Public Service Corp. of New Jersey, Newark, N. J., to Bethlehem Steel Co.

1000 tons, state bridges, Montgomery county, Pennsylvania, to the American Bridge Co., Pittsburgh.

700 tons, warehouse and office building, Raytheon Mfg. Co., Waltham, Mass., to American Bridge Co., Pittsburgh; Thomas O'Connor & Co., Cambridge, Mass., general contractor.

650 tons, warehouse, Frankford Grocery Co., Philadelphia, to Bethlehem Steel Co.

350 tons, three-span continuous rolled beam bridge with 173-foot square span over New Haven railroad, Darien, Conn., to Phoenix Bridge Co., Phoenixville, Pa.; Brunalli Construction Co., Southington, Conn., general contractor.

210 tons, two-span continuous plate girder bridge with skew span of 205 feet over Wilbur Cross highway, Tolland, Conn., to Phoenix Bridge Co., Phoenixville, Pa.; Enfield Road Construction Co., Thompsonville, Conn., general contractor.

165 tons, overpass over Post road, 110-foot single span composite girder bridge, Darien, Conn., to Phoenix Bridge Co., Phoenixville, Pa.; Brunalli Construction Co., Southington, Conn., general contractor.

150 tons, prefabricated warehouses for various Washington state plants, also 50 tons shapes for Eastern Washington industry, to be fabricated by Structural Steel Co., Seattle.

150 tons, Widener Memorial School, Philadelphia, to Bethlehem Steel Co.

120 tons, four stringer bridges, Cummington-Goshen, Mass., to Phoenix Bridge Co., Phoenixville, Pa.; Thomas B. Rawson, Woburn, Mass., general contractor.

117 tons, bridge 6734, Norman county, Minnesota, to Illinois Steel Bridge Co., Jacksonville, Ill.

110 tons, Du Pont plant, Sussex county, Delaware, to Bethlehem Fabricators Inc., Bethlehem, Pa.

STRUCTURAL STEEL PENDING

6000 tons, relocation of bridge over Milwaukee Railroad, Chamberlain, S. Dak., for United States Engineer, Omaha, Nebr.; bids Feb. 14.

1500 tons, towers and other installation, Navy communication center, Jim Creek, Wash.; bids in Jan. 19.

950 tons, Mayo Memorial Medical Center, Minneapolis, for University of Minnesota; bids Feb. 21.

900 tons, power station, unit No. 3, Kentucky Utilities Co., Tyrone, Ky.; bids Jan. 31; Sargent & Lundy, Chicago, engineers.

800 tons, addition, Federal Reserve Bank, Boston; pending.

700 tons, plant, Philco Corp., Philadelphia, for erection in Edgerly, Bucks county, Pennsylvania; bids Jan. 30.

500 tons, bridge 6483, Red Wing, Minn.; bids in.

580 tons, state bridge, Brandywine river crossing, New Castle county, Delaware; bids Feb. 7.

500 tons plus, also bridge grid decking; bids to Luke Nichols, president, Port Commission, Hood River, Oreg., Jan. 31.

495 tons, bridge F-194, Washington county, Iowa; bids in.

415 tons, bridge 6484, Red Wing, Minn.; bids in.

370 tons, kitchen and new patients building, hospital, Reading, Pa.; bids closed.

350 tons, Washington state Lewis county truss bridge; bids to Olympia, Feb. 6.

300 tons, powerhouse, gates, hoists, Albeni Falls, Idaho, dam project; plans out, bids soon to U. S. Engineer, Seattle.

300 tons, warehouse, garage and office, Metropolitan Edison Co., York, Pa.

250 tons, Quaker Rubber Mfg. Co., Tacony, Philadelphia; bids Jan. 29.

200 tons, bridge, Pennsylvania railroad, Eddington, Pa.; bids Jan. 31.

211 tons, bridge F-554, Pottawattamie county, Iowa; bids in.

190 tons, bridge SN-1853, Cass county, Iowa; bids in.

175 tons, central office, Bell Telephone Co., Asbury, N. J.; pending.

150 tons, three bridges, Pennsylvania Railroad; bids Jan. 31

150 tons, Spokane industrial building; bids soon; Sig Ivarsson, Seattle, engineer.

REINFORCING BARS . . .

REINFORCING BARS PLACED

2000 tons, Ladd and Elelson air fields, Alaska, barracks and other military construction, to Northwest Steel Rolling Mills Inc., Seattle. Anderson Construction Co. and Benson-Montain, joint contractors.

2000 tons, power house, Paducah, Ky., to Concrete Steel Co., New York.

660 tons, Cleveland Electric Illuminating Co., Eastlake, O., to United States Steel Supply Co., Cleveland.

650 tons, Racine Ave. pumping station, extension L, Chicago, to United States Steel Supply Co., Chicago; FitzSimons & Connell Dredge & Dock Co., Chicago, contractor.

600 tons, Cooper-George apartments, Spokane, Wash., to Bethlehem Pacific Coast Steel

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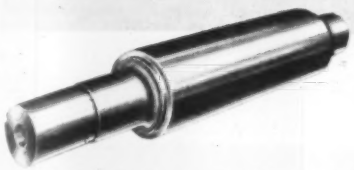

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Corp., Seattle; Henry George & Sons, Spokane, general contractor.

500 tons, Electro Metallurgical Co., Union Carbide & Carbon Corp., Marietta, O., to Bethlehem Steel Co.

385 tons, Chicago Housing Authority, site No. 8, Chicago, to Bethlehem Steel Co.; S. N. Nielsen Co., Chicago, contractor.

376 tons, Dr. Norman Beatty Hospital, Westville, Ind., to United States Steel Supply Co., Chicago; Superior Construction Co., Gary, Ind., contractor.

315 tons, Beechmont levee, Cincinnati, to Pollak Steel Co., that city.

314 tons, Central Junior High School, Rock Island, Ill., to Laclede Steel Co., St. Louis; C. H. Langman & Son, Rock Island, Ill.

205 tons, municipal court and jail, Gary, Ind., to Olney J. Dean Steel Co., Chicago; John A. Adinolfi, East Chicago, Ind., contractor.

200 tons, Crippled Children's Hospital, Iowa City, Iowa, to Laclede Steel Co., St. Louis, contractor.

200 tons, Shelby Mutual Insurance Bldg., Shelby, O., to Pollak Steel Co., Cincinnati.

200 tons, project 540, Wayne county, Ohio, to Pollak Steel Co., Cincinnati.

200 tons, project 519, Meigs and Athens counties, Ohio, to Truscon Steel Co., Youngstown, O.

175 tons, Oakview School, Dayton, O., to Truscon Steel Co., Youngstown, O.

150 tons, building, American Radiator & Standard Sanitary Co., Tiffin, O., to United States Steel Supply Co., Cleveland.

140 tons, state highway project 492, Akron, O., to United States Steel Supply Co., Cleveland.

100 tons, annealing furnaces, Ford Motor Co., Dearborn, Mich., to United States Steel Supply Co., Cleveland.

REINFORCING BARS PENDING

5000 tons, second unit Seattle traffic viaduct; Morrison-Knudsen Co. and Rumsey & Co., Seattle, joint low bidders, $3,691,400.

1245 tons, regional office and clinic building No. 11, Veteran's Administration, Chicago; bids in; Gust K. Newberg Construction Co., Chicago, low on general contract.

1200 tons, United States Engineer, Cincinnati.

1000 tons, Rosemont Plaza Apartments, Chicago; bids in.

900 tons, mill addition, Northwestern Steel & Wire Co., Sterling, Ill.

500 tons, furnishing and delivering, mat reinforcement, East Hartford and Glastonbury, Conn., expressway; bids in Hartford, Conn.

335 tons, sewage treatment plant, Saginaw, Mich.

250 tons, warehouse, United States Rubber Co., Detroit.

200 tons, state highway bridges, Lewis county, Washington; bids to Olympia, Feb. 6.

200 tons, Albeni Falls, Idaho, dam project; bids to U. S. Engineer, Seattle, soon; plans out.

192 tons, exchange building, Illinois Bell Telephone Co., Blue Island, Ill.

180 tons, state bridge, Brandywine river crossing, New Castle county, Delaware; bids Feb. 7.

170 tons, exchange building, Illinois Bell Telephone Co., Arlington Heights, Ill.

125 tons, administration building, Millers National Insurance Co., Chicago; bids in.

100 tons, York Township High School, Elmhurst, Ill.

100 tons, also steel pipe, trash racks, etc., Haskins Creek dam project, McMinnville, Oreg.; Miller & Strong, Eugene, Oreg., low $350,669.

Unstated, 121-foot state highway bridge, Bonner county, Idaho; Sather & Sons, Yardley, Wash., low $83,089.

PLATES . . .

PLATES PLACED

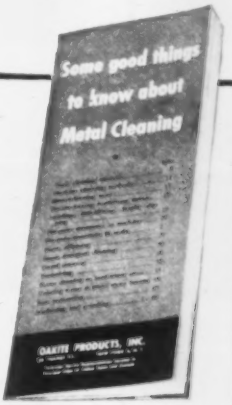
3000 tons, eight tanks, Esso Refining Co., Baltimore, to Bethlehem Steel Co.

100 tons plus, additional storage tanks, Portland, Oreg., terminals of Shell Oil Co., to Chicago Bridge & Iron Co., Seattle.

PLATES PENDING

2500 tons, steel piling, second unit traffic viaduct, Seattle; general contract to Morrison-Knudsen Co. and Rumsey & Co., Seattle.

250 tons, 48 and 64-inch steel pipe, Water



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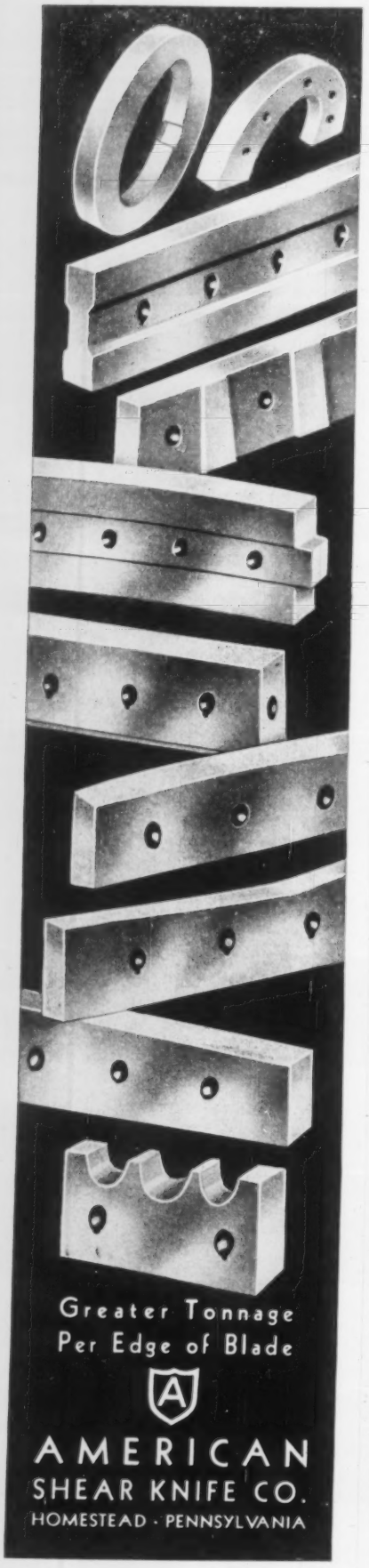

Inclusion: Metropolitan District Commission, Boston-Cambridge, Merritt-Chapman & Scott Corp., New York, low.

100 tons plus, storage tanks, relocation project, Lamont Point, Oreg., bids to U. S. Engineer, Portland, Oreg., Jan. 30.

Unstated, 54-inch welded steel pipe for Quincy pumping plant, Columbia Basin project, bids to Bureau of Reclamation, Denver, Feb. 15.

Unstated, $2 million Bow Lake water system expansion, involving 3160 feet 72-inch, 33,113 feet to 16-inch and 2200 feet 48-inch mains, bids to Seattle within 30 days.

PIPE . . .

CAST IRON PIPE PLACED

1700 tons, 4 to 12-inch, Metropolitan District Commission, Hartford, Conn., to Warren Pipe & Foundry Co., Everett, Mass.

100 tons, 10 to 4-inch for Pocatello, Idaho, and 6-inch stock for Tillamook, Oreg., to E. N. Haligren Co., Seattle, for American Cast Iron Pipe Co., Birmingham, Ala.

CAST IRON PIPE PENDING

Unstated, 12 and 8 inch, and alternatives; bids to Montesano, Wash., Jan. 23.

RAILS, CARS . . .

RAILROAD CARS PLACED

Bangor & Aroostook, 500 forty-ton refrigerator cars, to its own shops.

Buffalo Creek, 1000 forty-foot 6-inch box cars, divided equally between American Car & Foundry Co., New York, and Pullman-Standard Car Mfg. Co., Chicago.

Chicago & Eastern Illinois, 500 fifty-ton box cars, 300 going to its own shops in Danville, Ill., and 200 to the American Car & Foundry Co., New York.

Chicago & Eastern Illinois, 1000 cars, comprising 700 fifty-ton twin hopper cars and 300 seventy-ton triple hopper cars, to Pressed Steel Car Co., Chicago.

Ford Motor Co., 120 seventy-ton mill type gondola cars, to Greenville Steel Car Co., Greenville, Pa.

Louisville & Nashville, 5950 cars, including 3000 fifty-ton hoppers, 2200 forty-foot fifty-ton box cars to Pullman-Standard Car Mfg. Co., Chicago; 450 pulp wood cars to own shops; 300 fifty-foot fifty-ton box cars to Pressed Steel Car Co., Chicago.

Missouri Pacific, four planetarium-dome cars, to the Pullman-Standard Car Mfg. Co., Chicago.

Southern Pacific, 1500 fifty-ton box cars, to its own shops.

Texas & Pacific, one planetarium-dome car, to the Pullman-Standard Car Mfg. Co., Chicago.

Union Pacific, 500 forty-ton stock cars and 500 seventy-ton covered hopper cars, to its own shops, Omaha, Nebr.

RAILROAD CARS PENDING

Delaware, Lackawanna & Western, 500 to 1000 steel hopper cars; bids asked.

Erie, 500 gondolas and 500 box cars; purchase authorized.

Virginian, 300 fifty-ton box cars; bids asked.

FERROALLOYS

(Continued from page 105)

4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Low-Carbon Ferrochrome: (Cr 67-72%.) Contract, carload, lump, bulk, max. 0.03% C 33.60c per lb of contained Cr, 0.04% C 31.50c, 0.06% C 30.50c, 0.10% C 30.00c, 0.15% C 29.75c, 0.20% C 29.50c, 0.50% C 29.25c, 1% C 29.00c, 1.50% C 28.85c, 2% C 28.75c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered, Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N, add 5c for each 0.25% of N above 0.75%.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%.) Contract, c.l. S M X D, bulk, 23.25c per lb of contained Cr, c.l., packed 24.15c, ton 25.50c, less ton 27.25c. Delivered Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max.) Contract, carload, packed, S MX D, 16.35c per lb of alloy; ton lot 17.2c; less ton lot, 18.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-38%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 2.2c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk, 20.65c per pound of contained chromium plus 11.5c per pound of contained silicon. Works, plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 36-39%, Al 7-9%, C 0.05% max.) 21.75c per lb of contained silicon plus 12.4c per lb of contained silicon plus aluminum, 3" x down, delivered.

Chromium Metal: (Min. 97% Cr and 1% Si.) Contract carload, 1" x D; packed, max. 0.5% C grade, $1.08 per lb of contained chromium; ton lot $1.10, less ton $1.12. Delivered, spot, add 5c.

Tungsten Alloys

Ferrotungsten: (70-80%.) Contract, 10,000 lb W or more, $3.25 per lb of contained W; 2000 lb W to 10,000 lb W, $3.25; less than 2000 lb W, $3.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.) Contract or spot, 1000 lb or more, $4.15 per lb of contained W; less than 1000 lb W, $4.25.

Silicon Alloys

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.60c per lb of contained Si; packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered, Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.10% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered, Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk 15.35c per lb of contained Si, carload packed 16.8c, ton lot 17.8c, less ton 18.95c. Delivered, Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.) Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.5c per lb of contained Si, carload packed 18.7c, ton lot 19.65c, less ton 20.7c. Delivered, Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.) Add 0.7c to 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe). C.l. lump, bulk, regular 20.0c per lb of Si, c.l. packed 21.2c, ton lot 22.1c, less ton 23.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe.) Contract, basis f.o.b. Niagara Falls, N. Y. lump, carload, bulk, 9.90c per lb of alloy; ton lots packed 11.30c, 200 to 1999 lb 11.65c, smaller lots 12.15c.

Briquetted Alloys

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 14.50c per lb of briquet, carload packed 15.2c, ton lot 16.0c, less ton 16.9c. Delivered. Add 0.25 for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 10.95c per lb of briquet, c.l. packaged 11.75c, ton lot 12.55c, less ton 13.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 11.15c, per lb of briquet, c.l. packed 11.95c, ton lot 12.75c, less ton 13.65c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet, c.l. packed 7.75c, ton lot 8.55c, less ton 9.45c. Delivered, Spot, add 0.25c.

(Small size—weighing approx 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c, c.l. packed 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

Calcium Alloys

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Delivered, Spot add 0.25c.

Titanium Alloys

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3% max., Si 4% max., C 0.10% max.) Carload ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 3% max., Si 4% max., C 0.10% max.) Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%.) Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-3%.) Contract, $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

Vanadium Alloys

Ferrovanadium: Open-hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, $3.10 per lb of contained Va. Delivered. Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3.20. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.) $3.30.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 68c; No. 79, 50c; freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

Zirconium Alloys

12-15% **Zirconium Alloy:** (Zr 12-15%, Si 30-45%, Fe 40-45%, C 0.20% max.). Contract, lump, bulk 7.0c per lb of alloy, c.l. packed 7.75c, ton lot 8.5c, less ton 9.35c, delivered. Spot, add 0.25c.

35-40% **Zirconium Alloy:** (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

Boron Alloys

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c. F.o.b. Washington Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

Other Ferroalloys

Ferrocolumbium: (Cb 56-60%, Si 8% max., C 0.4% max.). Contract, ton lot, 2" x D, $1.90 per lb of contained Cb; less ton $1.95. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min., C 0.30 max.) ton lots, 2" x D, $3.75 per lb of contained Cb plus Ta, delivered; less ton lots $3.80.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.35-0.75%). Carload packed, 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, 1" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%, C 1, packed, 18c per lb of alloy; ton lots 19c; less ton lots 20.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%, C 1, packed, 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal. Fe) Lump, carload, bulk 14.50c, packed 15.50c; ton lots, packed, 15.75c; less ton lots, packed, 16.25c per lb of alloy, delivered to destination within United States.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt Pleasant, or Siglo, Tenn., $85 per gross ton.

Ferromolybdenum: (55-75%). Per lb. contained Mo, f.o.b. Langeloth, $1.32; Washington, Pa., furnace, any quantity $1.13.

Technical Molybdic-Oxide: Per lb. contained Mo, f.o.b. Langeloth $1.14, packed in bags containing 20 lb of molybdenum; Washington, Pa., 95.00c.

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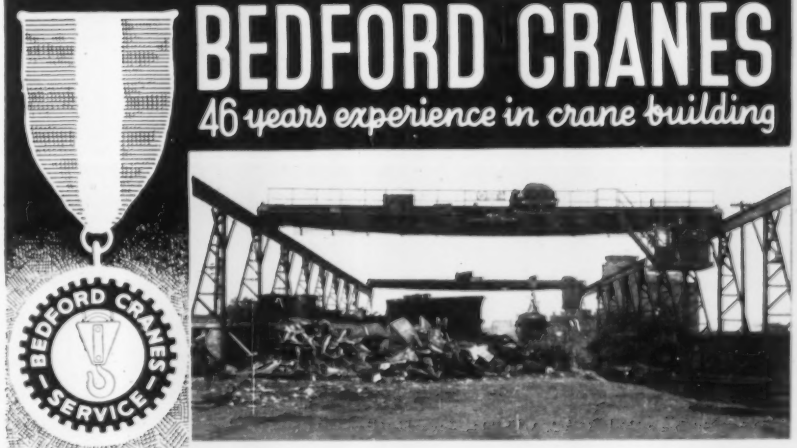

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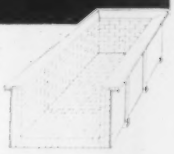

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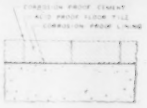

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Metalworking Briefs . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

California

National Motor Bearing Co. Inc., Redwood City, Calif., is constructing an addition to its plant and offices in that city. Construction is in charge of Dinwiddie Construction Co., San Francisco.

California

Southwest Welding & Mfg. Co., Alhambra, Calif.—maker of refinery equipment, construction machinery and fabricator of pipe and other steel products—acquired part of the former Richmond shipyard No. 1 prefabricating plant on San Francisco bay and plans to begin a new operation there within 60 days.

California

Western Division, **Irving Subway Grating Co.,** Long Island City, N. Y., purchased a building adjoining its present plant at 1819 Tenth St., Oakland, Calif., from Independent Iron Works. The company makes open steel flooring or grating, bridge decking and grilles, airfield landing mats, etc.

California

Aerolab Development Co. Inc., Pasadena, Calif., moved to expanded facilities in Pasadena, Calif. The firm does research on aerophysics equipment and windtunnels.

Connecticut

Fafnir Bearing Co., New Britain, Conn., moved three of its branch offices to new locations: Charlotte branch office and warehouse, 119 W. 29th St., Charlotte 6, N. C.; Chicago branch office and warehouse, 3334 W. Newport Ave., Chicago 18; Cincinnati sales office, 920 E. McMillen St., Cincinnati 6.

Delaware

Gail Iron Works Inc. filed a charter of incorporation with the secretary of state's office, Dover, Del. Capital Trust Co. of Delaware, Dover, is serving as the principal office.

Delaware

Independent Aluminum Corp. was chartered by the secretary of state's office, Dover, Del. Capital of the firm is listed at $100,000. Corporation Trust Co., Wilmington, Del., is serving as the principal office.

Illinois

General Controls Co., Glendale, Calif., plans to build a factory and warehouse at Skokie, Ill. The company has asked for bids on construction.

Illinois

Sterling Bolt Co., Chicago, moved its warehouse and office facilities to 363-405 W. Erie St. The company will continue to operate its manufacturing plant at 1228 W. Monroe St., that city.

Illinois

Chemco Products Co. Inc., Lyons, Ill., changed its name to **Pelron Corp.** Management, personnel and location remain the same. The company makes industrial chemicals.

Illinois

Mall Tool Co., Crete, Ill., awarded the general contract for a $100,000 addition to its plant in that city to Allen Parker, Harvey, Ill.

Maryland

Westinghouse Electric Corp. plans erection of a third plant in Baltimore. The plant will be erected on a site at the Friendship International Airport, subject to final approval by municipal officials. The $9 million plant will produce electronic airplane equipment.

Maryland

Gerotor-May Corp., Baltimore, manufacturer of domestic oil heating equipment, oil pumps and motors, etc., has acquired a building at 1500 Russell St., that city, as a branch plant. It will house its oil burner, sales and service departments. Space made available in its main plant through transfer of these departments will be equipped to augment production of its products. Edward E. Yaggy Jr. is president.

Maryland

Baltimore Aircoil Co. Inc., Baltimore, manufacturer of condensers for refrigeration and air conditioning equipment, is moving into larger quarters at 2519-2525 Pennsylvania Ave. Its former plant at 709 W. Pratt St. will be retained for the manufacture of parts which are to be assembled at the new location.

Maryland

Cambridge Wire Cloth Co., Cambridge, Md., appointed these distributors for its line of gripper woven wire slings: Manufacturers Supply Co., Grand Rapids, Mich.; James

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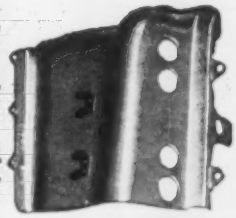

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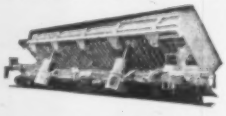

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Maryland

Washington Aluminum Co. Inc., Arbutus, Md., aluminum fabricator, is installing new equipment and doubling its present force to 100 workers. Defense orders are responsible for the expansion.

Maryland

Hill-Chase Steel Co., Baltimore, purchased five acres of land in that city for the erection of a steel warehouse.

Michigan

Majestic Tool & Mfg. Co., Detroit, changed its name to **Parker-Majestic Inc.**

Missouri

Insulation & Wires Inc., St. Louis, is appointed an authorized distributor for General Electric insulating materials, produced by the latter company's chemical department, Pittsfield, Mass.

Missouri

Walsh Refractories Corp., St. Louis, changed the name of its high-burn Missouri super duty fire brick from Mullitex RB to Mullitex HB.

New Jersey

E. I. du Pont de Nemours & Co., Wilmington, Del., contracted for construction of a plant at Deepwater Point, N. J. The plant will have an annual production capacity of about 50 million pounds of tetraethyl lead a year and will come into production by January, 1952.

New Jersey

Bennett Machinery Co. moved its headquarters to its plant and warehouse in Clifton, N. J.

New York

New Process Gear Corp., Syracuse, N. Y., acquired International Harvester Co.'s foundry in Auburn, N. Y., and the plant used by General Electric Co. in Syracuse during World War II.

Ohio

B. C. Ames Co., Waltham, Mass., appointed H. G. Collins Co. as its exclusive representative in the Cleveland area. The Collins firm will handle the complete Ames line of micrometer dial gages and indicators.

Ohio

Baker Industrial Truck Division, Baker-Raulang Co., Cleveland, appointed three new sales and service representatives. In the New York metropolitan area and northern New Jersey, Baker-Raulang N. Y. Corp. and the Material Handling Equipment Co. have combined into a new organization under the name of the latter. In central and northeastern New York state, Material Handling Co., Syracuse, N. Y., will handle all sales, service and engineering for Baker. The Houston branch of Dillon Scale & Equipment Co. Inc. will represent the company in that area.

Pennsylvania

Lukens Steel Co., Coatesville, Pa., will spend $3 million for the concentration of several supporting shops into one central building.

Pennsylvania

Hamel Corp., Long Island City, N. Y., took a long term lease on the foundry building of Finch Mfg. Co., Scranton, Pa. Hamel Corp., a metal fabricating concern, is installing machinery preparatory to beginning production in February.

Pennsylvania

American Chain & Cable Co. Inc., Bridgeport, Conn., leased a plant in Duryea, Pa., and will begin operations there Mar. 1.

Vermont

Howe Scale Co., Rutland, Vt., opened branch offices at 2524 Walnut St., Denver, with D. O. Ferris, manager; and at 2215 McKinney Ave., Houston, with H. K. Leonard, manager.

British Columbia

Powell River Paper Co., Powell River, B. C., plans a $11 million expansion program which will increase its newsprint output to 40,000 tons annually. Contracts involving $2 million have been awarded to date. Improvements proposed include an acid plant, sawmill and terminals rebuilding.

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